NORMAN PROJECT, OKLAHOMA

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MAIN READING ROOM

HEARING

BEFORE THE

SUBCOMMITTEE ON IRRIGATION AND RECLAMATION

OF THE

COMMITTEE ON INTERIOR AND INSULAR AFFAIRS UNITED STATES SENATE

EIGHTY-SIXTH CONGRESS

FIRST SESSION

ON

S. 1892

A BILL TO AUTHORIZE THE SECRETARY OF THE INTERIOR TO CONSTRUCT, OPERATE, AND MAINTAIN THE NORMAN PROJECT, OKLAHOMA

AUGUST 12, 1959

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NORMAN PROJECT, OKLAHOMA

WEDNESDAY, AUGUST 12, 1959

U.S. SENATE,
COMMITTEE ON INTERIOR AND INSULAR AFFAIRS,
SUBCOMMITTEE ON IRRIGATION AND RECLAMATION,
Washington, D.C.

The subcommittee met, pursuant to call, in room 3110, New Senate Office Building, at 10:05 a.m., Senator Clinton P. Anderson presiding.

Present: Senators Anderson, Allott, Jackson, and Kuchel.

Senator ANDERSON. The subcommittee will come to order.

We have two important bills on the agenda for today.

The first is S. 1892 to authorize the Norman project in Oklahoma. The second is to authorize the La Feria division of the Lower Rio Grande rehabilitation project in Texas. The latter will be discussed separately and printed in another document.

I will place S. 1892 and its departmental reports on it at this place in the record.

(The exhibits are as follows:)

[S. 1892, 86th Cong., 1st sess.]

A BILL To authorize the Secretary of the Interior to construct, operate, and maintain the Norman project, Oklahoma

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of the Interior is authorized to construct, operate, and maintain the Norman Federal reclamation project, Oklahoma, in accordance with the Federal reclamation laws (Act of June 17, 1902, and Acts amendatory thereof or supplementary thereto), except so far as those laws are inconsistent with this Act, for the principal purposes of storing, regulating, and furnishing water for municipal, domestic, and industrial use, and for controlling floods, and, as incidents to the foregoing for the additional purposes of regulating the flow of the Little River, providing for the preservation and propagation of fish and wildlife, and of enhancing recreational opportunities. The Norman project shall consist of the following principal works: A reservoir on Little River near Norman, Oklahoma, pumping plants, pipelines, and other conduits for furnishing water for municipal, domestic, and industrial use.

SEC. 2. In constructing, operating, and maintaining the Norman project, the Secretary shall allocate proper costs thereof in accordance with the methods used in determining the allocations made on page XI and table 4, page 25, Document Numbered 420, Eighty-fifth Congress, second session, but with appropriate adjustments for changes in actual cost of construction, under the following conditions:

(a) Allocations to flood control, recreation, and the preservation and propagation of fish and wildlife and water supply for Tinker Air Force Base shall be nonreturnable.

(b) Allocations to municipal water supply, including domestic, manufacturing, and industrial uses, with the exception of that for Tinker Air Force Base, shall be repayable to the United States by the water users through contracts with municipal corporations, or other organizations as defined by section 2, Reclamation Project Act of 1939 (53 Stat. 1187), and title III of the Flood Control Act

of 1958. Such contracts shall be precedent to the commencement of construction of my project unit affecting the individual municipalities, and shall provide for repayment of construction costs allocated to municipal water supply in not to exceed fifty years from the dates water is first delivered for that purpose, and payments of said construction costs shall include interest on unamortized balances of that allocation at a rate equal to the average rate (which rate shall be certified by the Secretary of the Treasury) paid by the United States on its marketable long-term securities outstanding on the date of this Act and adjusted to the nearest one-eighth of 1 per centum: *Provided*, That the water users' organization be responsible for the disposal and sale of all water surplus to its requirements, and that the revenues therefrom shall be used by the organization for the retirement of project debt payment, payment of interest, and payment of operation and maintenance cost.

(c) Upon the completion of the payment of the water users' construction cost obligation, together with the interest thereon, the water users shall have a permanent right to the use of that portion of the project allocable to municipal water supply purposes.

SEC. 3. Contracts may be entered into with the water users' organization pursuant to the provisions of this Act without regard to the last sentence of subsection (c) of section 9 of the Reclamation Project Act of 1939.

SEC. 4. The Secretary is authorized to transfer to the project water users the care, operation, and maintenance of the works herein authorized, and, if such transfer is made, to deduct from the obligation of the water users the reasonable capitalized equivalent of that portion of the estimated operation and maintenance cost of the undertaking which, if the United States continues to operate the project, would be allocated to flood control and fish and wildlife purposes. Prior to taking over the care, operation, and maintenance of said works, the water users' organization shall obligate itself to operate them in accordance with criteria specified by the Secretary of the Army with respect to flood control and the Secretary of the Interior with respect to fish and wildlife: *Provided*, That operation and maintenance and replacement cost of furnishing water supply to Tinker Air Force Base, as contemplated in the plan of development, shall be provided by an appropriate agreement between the Secretary of Defense and the water users' organization.

SEC. 5. Construction of the Norman project herein authorized may be undertaken in such units or stages as in the opinion of the Secretary best serves the project requirements and the relative needs for water of the several municipal users. Repayment contracts negotiated in connection with each unit or stage of construction shall be subject to the terms and conditions of section 2 of this Act.

SEC. 6. The Secretary may, upon conclusion of a suitable agreement with any qualified agency of the State of Oklahoma or a political subdivision thereof for assumption of the administration, operation, and maintenance thereof at the earliest practicable date, construct or permit the construction of public park and recreational facilities on lands owned by the United States adjacent to the reservoirs of the Norman project, when such use is determined by the Secretary not to be contrary to the public interest, all under such rules and regulations as the Secretary may prescribe. No recreational use of any area to which this section applies shall be permitted which is inconsistent with the laws of the State of Oklahoma for the protection of fish and game and the protection of the public health, safety, and welfare. The Federal costs of constructing the facilities authorized by this section shall be limited to the nonreimbursable costs of the Norman project for recreation, as set forth in House Document Numbered 420, Eighty-fifth Congress, second session.

SEC. 7. Expenditures for the Norman Reservoir may be made without regard to the soil survey and land classification requirements of the Interior Department Appropriation Act, 1954 (43 U.S.C. 390a).

SEC. 8. There are hereby authorized to be appropriated such sums as may be required to carry out the purposes of this Act.

U.S. DEPARTMENT OF THE INTERIOR,
OFFICE OF THE SECRETARY,
Washington, D.C., August 11, 1959.

Hon. JAMES E. MURRAY,
Chairman, Committee on Interior and Insular Affairs,
U.S. Senate, Washington, D.C.

DEAR SENATOR MURRAY: This responds to your request for the views of this Department on S. 1892, a bill to authorize the Secretary of the Interior to construct, operate, and maintain the Norman project, Oklahoma.

We recommend that the bill be enacted and that it be amended in the manner hereinafter proposed.

The proposed multiple-purpose Norman project would be located in central Oklahoma in and adjoining the Little River Basin in Cleveland and Oklahoma Counties. Our planning report on the project was submitted to the President of the Senate and Speaker of the House of Representatives on July 1, 1958, and was printed as House Document No. 420, 85th Congress. This report was based upon studies which were completed in 1954.

Norman, Midwest City, Del City, Okla., and Tinker Air Force Base now derive their water by ground water pumping. Their water requirements are continuing to grow and forecasts of future requirements indicate that continued reliance upon ground water alone will result in serious difficulties unless some such development as the proposed Norman project is built.

Our planning report proposed a Norman Reservoir with a conservation storage capacity of 107,300 acre-feet, which it was believed would furnish adequate water to meet the estimated requirements of the three project municipalities and the military installation through the year 2010.

Norman Reservoir would also provide flood-control benefits through controlling all floods of record at the damsite, thus protecting valuable farmland and property. There would be minor flood benefits in the Canadian River Basin downstream from the mouth of the Little River.

The U.S. Fish and Wildlife Service has found that the existing stream fishery of low value would be replaced by a good reservoir fishing opportunity. Responsibility for the conservation and development of fish and wildlife values will rest with the Oklahoma Game and Fish Department in cooperation with the Fish and Wildlife Service.

Since almost one-fourth of the State's population lives within 50 miles of the Norman Reservoir site, the project could provide recreational opportunities for a population concentration which is currently without adequate facilities of the nature which the project would make available. The project plan proposes Federal construction of those minimum basic facilities required for the protection of the health and safety of the visiting public. Additional recreational facilities, not appropriate for Federal construction, would be provided by local interests.

The cost of construction of Norman Dam and Reservoir, pumping plants, and pipelines, on the basis of May 1954 prices with interest during construction, was estimated at about $15 million. Our planning report proposed that the Federal Government undertake the construction of the dam and reservoir and related minimum basic recreation facilities at a cost of $8,336,000, and Federal participation in the costs of construction of pumping plants and pipelines to the extent of about $892,000, which represented a pro rata share of the cost of the aqueduct system to serve the Tinker Air Force Base. Local interests would build the necessary pumping plants, pipelines, and additional recreation facilities.

The project cities expressed a strong preference for Federal construction of the aqueduct system as well as the dam and reservoir at the time the report was prepared, but indicated their willingness, if necessary, to build the pipelines and pumping facilities and the water treatment works.

The proposed plan of development was found to have engineering feasibility and to be economically justified. On 50-year and 100-year periods of analysis, the respective benefit-cost ratios were found to be about 1.7 to 1 and 1.8 to 1.

Because the report was based on studies which were completed in 1954, the Bureau of Reclamation has recently completed a reappraisal of the proposed Norman project, taking into account the effect of the severe drought of 1951–57 on the estimated firm reservoir yield, significant increases in land acquisition and relocation costs, general increases in construction costs, all-Federal as well as joint development, and other factors which will affect the project plan.

As the effect of the recent drought was to decrease significantly the firm yield of Norman Reservoir as previously reported, the reappraisal involved studies

of Norman Reservoir with the original conservation storage capacity of 107,300 acre-feet and with 140,900 acre-feet of conservation storage capacity. Either reservoir, operated in conjunction with occasional use of existing ground water pumping facilities, could meet the project requirements for 50 years. The larger reservoir, which will increase the annual firm yield about 20 percent at an increase in cost of about $1,140,000, is now favored for the project plan. Increasing the annual firm yield will reduce the quantity and frequency of ground water pumping. In addition, arrangements may be concluded between the Central Oklahoma Water Users' Association and Oklahoma City for the city to purchase the entire yield of the reservoir surplus to project needs.

Based on October 1958 prices, the cost of constructing the project is now estimated at $19,042,000. The Federal cost under joint development would amount to about $12,920,000, consisting of $11,511,000 for Norman Dam and Reservoir, $315,000 for minimum basic recreational facilities, and $1,094,000 for that portion of the cost of the aqueduct system which would be allocable to furnish water to Tinker Air Force Base. The remaining cost of the aqueduct system, which would be constructed by the project water users under joint development, or by the Federal Government under the all-Federal plan, would amount to $6,122,000. In either case, local interests would build and pay for the necessary water treatment works at an estimated cost of $3,227,000.

The Federal costs of the Norman project have been allocated as follows:

Purpose	Construction cost	Interest during construction	Total
Municipal and industrial water supply:			
Joint development	$6,970,000	$274,000	$7,244,000
All Federal development	13,092,000	416,000	13,508,000
Flood control	3,275,000	129,000	3,404,000
Fish and wildlife	2,360,000	91,000	2,451,000
Recreation	315,000	0	315,000

Annual benefits from all purposes would exceed the annual economic costs in the ratio of over 2 to 1 for either plan and for either a 100-year or 50-year period of analysis.

Under the terms of S. 1892, the municipalities would be required to enter into contracts, prior to construction, for repayment with interest of the capital costs of the project works allocated to municipal water supply. Allocations of costs to flood control, recreation, conservation and development of fish and wildlife, and water supply for Tinker Air Force Base would be nonreimbursable and nonreturnable. The disposal and sale of surplus water would be the responsibility of the water users' organization representing the municipalities, and the revenues from such disposal and sale would be required to be used for retirement of the capital cost repayment obligation, payment of interest thereon, and payment of operation and maintenance costs. The bill further provides that upon completion of payment of the amount of the capital costs allocated to municipal and industrial water supply, with interest, the municipalities would have a permaent right to the use of that portion of the project works allocated to municipal water supply purposes. The cities' repayment obligation under the joint development plan would be $4,851,000 and under the all-Federal plan, $11,115,100, which would be repaid with interest within 50 years, as the bill provides. This obligation would be reduced by $374,400 to compensate the cities for the capitalized value of operation, maintenance, and replacement costs allocated to nonreimbursable purposes.

After considering the changes in circumstances, this Department still favors joint development if this can be accomplished within the bonding authority of the project cities and would not impose an undue burden upon them. Whether or not joint development can be accomplished may well depend upon the arrangements that can be worked out with Oklahoma City. The provisions of the bill would provide authority for Federal construction of all Norman project facilities. To make it possible for this Department to attempt to work out a construction program of joint development or all-Federal development, whichever may be determined to be the more feasible, we recommend that the bill be amended by adding at the end of section 1, in line 7, page, 2, a new sentence reading as follows:

"The Secretary may enter into suitable contracts with municipal organizations, or other organizations as defined in section 2, Reclamation Project Act of 1939 (38 Stat. 1187), to undertake with non-Federal financing the construction of pumping plants, pipelines, and other conduits, or of any of such works, for furnishing water for municipal, domestic, and industrial use, and to advance to such organizations during the construction period funds to cover an appropriate share of the costs thereof attributable to furnishing water to Tinker Air Force Base."

In order to avoid possible ambiguities and conform the provisions of the bill to present policies, we recommend the following amendments:

1. Delete all language appearing in lines 10 through 14, inclusive, on page 2 and substitute therefor the words "thereof in accordance with the following conditions:".

The separable costs-remaining benefits method of cost allocation was used in the economic analysis in our project planning report which was published as House Document 420, 85th Congress. The Federal agencies concerned with water resources development projects, including the Bureau of Reclamation of this Department, have agreed upon the use of this method. However, some minor changes in the application of the method have been adopted since the Norman project planning report was prepared and we believe it would be undesirable to have language in the authorizing legislation which might throw some doubt on the use of the latest procedures, costs, or price bases.

2. In line 24, page 2, delete the words "and title III of the Flood Control Act of 1958" and substitute therefor the words "under the provisions of the Federal reclamation laws, and to the extent appropriate, under the Water Supply Act of 1958".

The substitute language we propose will make clear that contracts for furnishing municipal water may be made under either or both of the two authorities cited and avoid the possibility that the references are only for purposes of defining the organizations with which contracts may be made. It will also make a technical correction in referring to the Water Supply Act of 1958 by its statutory title. Whether or not contracts will be entered into under the authority of this latter act will depend, it now seems, upon the outcome of negotiations with Oklahoma City for the sale to it of surplus water.

3. In line 5, page 3, after the word "and" add a comma and the phrase "notwithstanding the provision in the Water Supply Act of 1958 relating to the rate of interest,".

The provision in section 2(b) of the bill relating to the computation of the rate of interest varies slightly from that which appears in the Water Supply Act of 1958. Since contracts for the sale of water may be made under both the Federal reclamation laws, utilizing the interest rate formula specified in the bill, and the Water Supply Act of 1958, an element of confusion would be avoided if the same interest rate formula is used, as our proposed amendment would provide. Of the two formulas, that which is specified in the bill is, in our judgment, preferable since the rate of interest would be fixed prior to contract negotiations and it could be adjusted to the nearest one-eighth of 1 percent.

4. Delete all language appearing in lines 17 and 18, page 5, and substitute therefor the words "for minimum basic recereational facilities as determined by the Secretary."

As is indicated heretofore the cost allocations and cost estimates appearing in our project planning report are based upon May 1954 prices. Since that time there has been a general rise in price levels so that the minimum basic recreational facilities which it is contemplated would be constructed by the Federal Government would cost more than indicated in House Document 420, 85th Congress.

5. In lines 2 and 16, page 2, substitute the words "conservation and development" for the words "preservation and propagation".

This minor technical amendment will conform the language of the bill to the provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended, 16 U.S.C., sec. 661, et seq.).

There are enclosed statements as to additional funds and personnel requirements for the Norman project under both plans of development, as required by Public Law 801, 84th Congress.

The Bureau of the Budget has advised that, while there would be no objection to the submission of such report as we deem appropriate, it would recommend against enactment of S. 1892 unless amended (1) to limit Federal participation

by the Department of the Interior in the project to the construction of the dam and reservoir, (2) to provide for a reallocation of cost with respect to fish and wildlife and recreation, as recommended in its letter of September 10, 1957, with respect to the project planning report, and (3) to provide for the computation of interest rates in accordance with the provisions of the Water Supply Act of 1958. Furthermore, the Bureau of the Budget would recommend that any action on the bill be deferred until the Congress has had an opportunity to consider and act upon S. 2060, the Flood Control cost sharing legislative proposal.

Sincerely yours,

FRED G. AANDAHL,
Assistant Secretary of the Interior.

DEPARTMENT OF THE INTERIOR—NORMAN PROJECT, OKLAHOMA

Estimated additional man-years of civilian employment and expenditures required, based on joint development of Norman project

	Fiscal year 1961	Fiscal year 1962	Fiscal year 1963	Fiscal year 1964
Estimated additional man-years of civilian employment:				
Executive direction:				
Executive	1	1	1	1
Stenographic	1	1	1	1
Total, executive direction	2	2	2	2
Administrative services and support:				
Administrative officer	1	1	1	1
Accountant	1	1	1	1
Clerical		2	2	2
Property management	1	1	1	1
Total, administrative services and support	3	5	5	5
Substantive (program):				
Engineering aids	5	15	15	13
Engineers	8	20	20	18
Total, substantive	13	35	35	31
Total, estimated additional man-years of civilian employment	18	42	42	39
Estimated additional expenditures:				
Personal services	100,000	230,000	230,000	210,000
All other	200,000	3,470,000	5,270,000	3,210,000
Total, estimated additional expenditures	300,000	3,700,000	5,500,000	3,420,000

Estimated additional man-years of civilian employment and expenditures required, based on all-Federal development of Norman project

	Fiscal year 1961	Fiscal year 1962	Fiscal year 1963	Fiscal year 1964
Estimated additional man-years of civilian employment:				
Executive direction:				
Executive	1	1	1	1
Stenographic	1	1	1	1
Total, executive direction	2	2	2	2
Administrative services and support:				
Administrative officer	1	1	1	1
Accountant	1	2	2	2
Property management	1	1	1	1
Clerical		2	2	2
Personnel				
Total, administrative services and support	3	6	6	6
Substantive (program):				
Engineering aids	5	17	20	18
Engineers	8	22	25	22
Total, substantive	13	39	45	40
Total, estimated additional man-years of civilian employment	18	47	53	48
Estimated additional expenditures:				
Personal services	100,000	260,000	290,000	260,000
All other	220,000	3,740,000	7,810,000	6,362,000
Total estimated additional expenditures	320,000	4,000,000	8,100,000	6,622,000

EXECUTIVE OFFICE OF THE PRESIDENT,
BUREAU OF THE BUDGET,
Washington, D.C., August 11, 1959.

Hon. JAMES E. MURRAY,
Chairman, Committee on Interior and Insular Affairs,
U.S. Senate, Washington, D.C.

MY DEAR MR. CHAIRMAN: This is in reply to your letter of May 12, 1959, requesting the views of the Bureau of the Budget on S. 1892, a bill to authorize the Secretary of the Interior to construct, operate, and maintain the Norman project, Oklahoma.

The project report of the Secertary of the Interior on the Norman project was submitted to the Congress on July 1, 1958. As described in this report, the proposed improvements would consist of a dam and reservoir on the Little River in Oklahoma, together with pumping plants and pipelines for water supply. The project would provide a municipal and industrial water supply for a number of communities in central Oklahoma and for Tinker Air Force Base. It would also provide flood control, fish and wildlife, and recreation benefits.

On the basis of a recent reappraisal of the project, the Department now favors a larger reservoir than that originally proposed in order to provide additional water conservation storage at an increased cost of about $1,140,000. The overall cost of constructing the enlarged Norman Dam and Reservoir, pumping plants, and pipelines, is estimated at $19,042,000, using October 1958 prices.

Under the joint development favored by the Department of the Interior in a report being submitted to your committee, the Federal participation would be about $12,920,000, representing the costs of the Norman Dam and Reservoir, minimum basic recreational facilities, and that portion of the cost of the aqueduct system allocable to furnishing water to Tinker Air Force Base. The remaining costs of $6,122,000 for distribution facilities would be the responsibility of the project water users.

The views of the Bureau of the Budget on the Norman project report are contained in our letter to the Secretary of the Interior of September 10, 1957, a copy of which is enclosed for your information. Our recommendations in that letter with respect to cost allocations for fish and wildlife and recreation, the nature of Federal participation in the costs of the project, and the execution of repayment contracts, are unchanged.

With respect to flood control, however, the President recommended to the Congress in his January budget message that legislation be enacted to establish uniform cost sharing standards for flood protection projects. A draft bill to accomplish this purpose was transmitted to the Speaker of the House of Representatives and the President of the Sentae by the Director of the Bureau of the Budget on May 5, 1959, and has since been introduced in the Senate as S. 2060. In general, it proposes that non-Federal interests bear at least 30 percent of project first costs allocated to flood prevention as well as all operation and maintenance costs allocated to flood prevention for all projects not yet under construction. In the case of reservoirs producing widespread benefits, non-Federal interests would participate only to the extent that flood prevention benefits are significant and accrue to identifiable groups.

The provisions of section 2(b) of S. 1892 with respect to the computation of interest rates vary slightly from the provisions of the Water Supply Act of 1958. We believe interest rates for water supply repayments for all projects should be determined on the basis of a uniform and consistent standard. Accordingly, we recommend that the bill be amended to conform to the interest rate provisions of the Water Supply Act of 1958.

We believe that S. 1892, in permitting full Federal development of the Norman project, raises a basic question of public policy with respect to the appropriate division of responsibilities between the Federal Government and the concerned local communities for municipal and industrial water supply. The Bureau of the Budget considers that Federal participation by the Department of the Interior should be limited to construction of the dam and reservoir, and that the benefiting local communities should be responsible for the pipelines and related facilities required to transport the water to consuming areas. State and local governments throughout the Nation have traditionally undertaken the construction of distribution facilities for local water supply without the kind of Federal assistance which would be authorized under S. 1892. The Bureau of the Budget considers that a departure from this established practice in the case of the Norman project is not justified.

Accordingly, the Bureau of the Budget would recommend against enactment of S. 1892 unless amended (1) to limit Federal participation by the Department of the Interior in the project to the construction of the dam and reservoir, (2) to provide for a reallocation of costs with respect to fish and wildlife and recreation, as recommended in our letter of September 10, 1957, and (3) to provide for the computation of interest rates in accordance with the provisions of the Water Supply Act of 1958. Furthermore, it is recommended that any action on the bill be deferred until the Congress has had an opportunity to consider and act upon S. 2060, the flood control cost sharing legislation referred to above.

Sincerely yours,

PHILLIP S. HUGHES,
Assistant Director for Legislative Reference.

EXECUTIVE OFFICE OF THE PRESIDENT,
BUREAU OF THE BUDGET,
Washington, D.C., September 10, 1957.

The Honorable the SECRETARY OF THE INTERIOR.

MY DEAR SECRETARY: This is in reply to your letter of June 20, 1957, transmitting your report on the proposed Norman project, Oklahoma, and requesting advice as to its relationship to the program of the President.

The proposed improvement would provide municipal and industrial water for the cities of Norman, Midwest City, and Del City, and for the Tinker Air Force Base. Pending completion of long-range plans for additional water supply works, the proposed project could provide a supplementary water supply to Oklahoma City, at least until such time as the needs of the project cities preclude such service. Provision would also be made for flood control, fish and wildlife preservation and propagation, and recreation. Physical features would include

an earthfill dam on Little River forming a reservoir of 363,000 acre-feet total capacity, pumping plants, and pipelines. Total estimated cost based on 1954 prices and a partnership arrangement is about $15 million which is tentatively allocated as follows:

	Federal		Non-Federal
	Reimbursable	Nonreimbursable	
Municipal and industrial water	$3,100,000		$5,100,000
Water supply for Tinker Air Force Base		$1,700,000	
Flood control		2,100,000	
Fish and wildlife		2,360,000	
Recreation		280,000	360,000
Total	3,100,000	6,440,000	5,460,000

Based on a 50-year period of analysis, annual costs are estimated at $628,000, annual benefits at $1,072,100 and the benefit-cost ratio is stated to be 1.71.

It is noted that a partnership arrangement comprising Federal construction of the reservoir and local construction of the facilities necessary to deliver water to the project cities has been explored with local interests. The water users have expressed a preference for an all-Federal project, but have indicated their willingness to participate in the partnership plan recommended by the Commissioner of Reclamation. The Bureau of the Budget concurs in this plan and believes that authorization of the proposed Norman project should limit Federal participation by the Department of the Interior to construction of the dam and reservoir. The Bureau of the Budget further recommends that initiation of construction be made contingent upon the execution of satisfactory contracts with responsible local interests for full repayment of the reimbursable costs, including interest, within a period of 50 years.

As noted above, the tentative allocation of costs includes a nonreimbursable amount of $2,360,000 for fish and wildlife. The report of the regional director states that "estimated fish and wildlife benefits would be realized incidental to operation of the reservoir for its dominant purposes, and therefore, no specific facilities or specific costs for fish and wildlife conservation are included in the plan." In view of this statement and other related information contained in the report, the Bureau of the Budget recommends that the total costs be reallocated to eliminate fish and wildlife conservation as a project purpose. It is recognized that such action would increase the amount to be repaid by the beneficiaries of the project.

The tentative allocation of costs also includes a nonreimbursable item of $280,000 for minimum basic recreational facilities. The Bureau of the Budget recommends that the cost of such facilities be classified as part of the joint costs of the project and be reallocated to the dominant project purposes.

It is noted that approximately one-third of the total annual flood control benefits are attributed to increased land utilization. The Bureau of the Budget recommends that authorization of the project be subject to an appropriate cash contribution by local interests to reflect the magnitude of this change in land ulilization. Such action would be in accord with current Federal policies on cost sharing. On the basis of information contained in the report, it would appear that the appropriate contribution might approximate $350,000.

Subject to consideration being given to the above-stated recommendtions, there would be no objection to submission of your proposed report to the Congress. No commitment, however, can be made at this time as to when any estimate of appropriation would be submitted for construtcion of the project, if authorized by the Congress, since this would be governed by the President's budgetary objectives as determined by the then prevailing fiscal situation.

Sincerely yours,

ROBERT E. MERRIAM, *Assistant Director.*

Senator ANDERSON. The subcommittee desires to have a complete record made on this proposed development. Consequently, we suggest that witnesses summarize their presentations and submit complete statements for the record, which will be printed in due course.

We will hear first the distinguished Senators who are sponsors of the respective bills, as well as any Members of the House of Representatives who may desire to make a presentation.

Senators Kerr and Monroney are the sponsors of this measure. You can draw lots as to who speaks first.

STATEMENT OF HON. ROBERT S. KERR, U.S. SENATOR FROM THE STATE OF OKLAHOMA

Senator KERR. Mr. Chairman, first I want to say to these great citizens of Oklahoma who are here that we are most fortunate in that the legislation we sponsor is before a subcommittee headed by our great friend from New Mexico. Since I have been in public life, I cannot remember when he was not working on some project that would benefit some part of Oklahoma. We are especially fortunate that he is in a position of prestige and power in connection with the project we sponsor.

I would like to introduce a brief statement for the record, Mr. Chairman.

Senator ANDERSON. Certainly.

Senator KERR. This is a bill introduced in the House by Congressman Jarman and in the Senate by Senator Monroney and myself.

When Senator Monroney, Congressman Jarman, and I introduced our bills for the authorization of the Norman project, we did so on two main premises: first, that the metropolitan growth of the project cities was such that they were in emergency need of a municipal and industrial water supply to supplement and supplant ground water sources which are being depleted at a greater rate than the recharge of the water into the land; secondly, we were aware that, because of the growth of the communities, they had reached the limits of their ability to raise revenue either by taxation or from the sale of water to improve and increase their water supply sufficiently to meet the immediate future needs.

After giving the matter careful study, we have concluded that the bill which is before you today represents the best possible solution to the problem.

I would remind you that the Federal agencies, including the Tinker Air Force Base, will participate in this project and, to a large degree, are responsible for the necessity of the increase in the capacity of municipal and industrial water in the area and, at the same time, are responsible for the present ground water supply being rapidly depleted.

I urge that the committee report the bill as it is before you, and may I hope that it will be done in order that we may have an opportunity to pass this legislation in the Senate this session.

I will now ask Senator Monroney for his comments.

STATEMENT OF HON. A. S. MIKE MONRONEY, U.S. SENATOR FROM THE STATE OF OKLAHOMA

Senator MONRONEY. Thank you, Senator Kerr.

Senator Kerr, Chairman Anderson, I appreciate the opportunity of being here and also wish to thank the chairman for his courtesy in

calling this meeting this late in the session, so that we could get the bill on the road.

Senator ANDERSON. I want to say to you, Senator Monroney, that we perhaps will not get a chance to get the bill out for this session, but we will certainly have a chance to complete all the testimony and get it, I am sure, favorably reported to the full committee and possibly get it before the full committee.

Senator MONRONEY. Whatever we are able to achieve, this hearing will expedite by many months the final action on the bill.

I wish to associate myself with the testimony I know you will hear. It has taken many years to get everyone together to realize, first, that this project has a very valuable flood protection in the Little River Valley, which almost annually overflows and destroys some of the most fertile farmland in the central part of Oklahoma.

Secondly, it will relieve the rather dangerous dependence of an area which will probably have a population far in excess of 100,000 people who are now completely and totally dependent on underground water of this rather tenuous and dangerous situation.

It will further additionally protect the Norman, Okla. Air Materiel Center, in which we have an investment of $750 million, and which each year produces an annual gross income to that area of over $175 million.

Without this project, I do not know how these vital areas can grow and expand, including the University of Oklahoma, at Norman, Midwest City, Del City, and other areas that will be asking for this water.

It will be highly reimbursable in the sales of water. The figures are that out of about $19 million estimated cost, it will be reimbursable from municipal and industrial water for $10,776,600 and the nonreimbursable will be $8,265,000 for flood control, recreation, and wildlife conservation.

I would like to extend on this statement and will not impose further on these good folks who have come all this distance to testify.

Senator ANDERSON. Thank you.

If either of the Senators wishes to amplify his statement later on with respect to any particular feature, you go ahead and do so.

Senator KERR. If it will be all right, we will ask John Jarman, Congressman from the district, who is sponsoring an identical bill in the House on this, to speak.

Senator ANDERSON. Come sit down here, Congressman.

STATEMENT OF HON. JOHN JARMAN, MEMBER OF CONGRESS FROM THE FIFTH CONGRESSIONAL DISTRICT OF OKLAHOMA

Representative JARMAN. Mr. Chairman and members of the subcommittee, we appreciate your giving us an opportunity to testify at this late date in the session on S. 1892, which was introduced by Senators Kerr and Monroney to authorize the Norman Lake project. There has been a real need for the development of a multipurpose project on the Little River, a tributary of the Canadian River in central Oklahoma. The authorization of the Little River project would provide for an urgently needed, new, dependable source of municipal and industrial water supplies for the cities of Norman, Midwest City, Del City, and for Tinker Air Force Base. It would also provide for

flood control, preservation, and propagation of fish and wildlife, recreational opportunities, and a limited amount of downstream irrigation. It should be said, Mr. Chairman, that extensive consideration has been given to this project by the Bureau of Reclamation and the Oklahoma Planning and Resources Board, as well as many private organizations and individuals. I shall leave the technical aspects of these considerations to the gentlemen who follow me, and will at this time only urge that the subcommittee look favorably upon S. 1892.

Senator ANDERSON. Thank you, Congressman.

Mr. Bailey is our next witness.

Senator KERR. Senator Anderson, with your permission, I will present the witnesses.

Senator ANDERSON. Go ahead.

Senator KERR. You are going to hear from representatives not only from Norman but also of Midwest City and Del City, and representatives of the State agency. These people come from one of the miracle areas of Oklahoma, Mr. Chairman, and the message they have is of great significance both to their communities and to the State.

One of the finest that we have is the Honorable Robert L. Bailey, State Senator from Norman.

Did you have a statement to make, Senator Bailey?

Mr. BAILEY. We do have a statement, but I think we will submit it in writing. Mr. Cooksey is going to speak.

(Mr. Bailey's statement is as follows:)

STATEMENT OF ROBERT L. BAILEY, ATTORNEY, CENTRAL OKLAHOMA WATER USERS ASSOCIATION

Mr. Chairman, and members of the subcommittee, my name is Robert L. Bailey. I am attorney for the cities of Midwest City, Del City, and Norman, Okla. I have examined applicable laws of the State of Oklahoma pertaining to water development for industrial and municipal uses, and find as follows:

The 1957 session of the Oklahoma State Legislature enacted into law title 82, section 541, which in substance provides as follows, to wit:

(1) Authorizes municipal planning by a conservancy district.

(2) Permits a conservancy district with the powers presently provided by law to serve as a master district, contracting with the several interests within its area which are in need of a project water supply, and also provides for necessary taxing powers.

(3) Permits a conservancy district or master district to contract under Federal reclamation law and enter into such stipulations and undertakings as are prerequisite to an acceptable repayment contract.

The cities and towns of Oklahoma, prior to 1957, had been restricted by the Oklahoma constitution in solving their water problems by working together on joint efforts. The constitution provided prior to that date that any facility had to be wholly owned by an individual city or town and could not be jointly owned. Article 10, section 27A, of the Oklahoma constitution, which was adopted in 1957 by a vote of the people, provides in substance, as follows, to wit:

"Incorporated cities and towns may individually or jointly, after approval of the proposition by a majority of the qualified electors, contract and pledge revenues for a term not to exceed 30 years, with other cities and towns, the State of Oklahoma, the United States of America, or any other governmental subdivision or agency, for the purpose of purchasing water, constructing, acquiring, or operating water facilities or purchasing or leasing reservoir space."

After reviewing the applicable law cited herein, it appears there is ample authority for the cities of Midwest City, Del City, and Norman to enter into a contractual agreement with the Federal Government for the purchase of water from the Norman Dam, when the same is completed; and for the cities to jointly provide for the construction of water treatment facilities, pumping and storage facilities, and distribution lines.

Senator KERR. Next we will hear from Mr. Harold Cooksey, who is president of the Central Oklahoma Water Users Association at Norman.

STATEMENT OF HAROLD COOKSEY, PRESIDENT, CENTRAL OKLAHOMA WATER USERS ASSOCIATION

Mr. COOKSEY. Mr. Chairman and Senator Kerr and Senator Monroney, Mr. Jarman, members of the committee, my name is Harold Cooksey. I am in business in Norman, Okla., and president of the Central Oklahoma Water Users Association. My assignment at this hearing is to summarize for you the testimony you are to hear or we are to file from representatives of the various components of our district and to present you a general picture of the district we serve. In addition, and due to the fact that I am a past president and at one time executive officer of the Oklahoma Oudoor Council, a statewide conservation organization interested in the phases of the conservation of our renewable natural resources, I have been selected to present the case for recreation and wildlife.

Our association has been active for several years and at present is creating the Central Oklahoma Master Conservancy District. Recently the Supreme Court of Oklahoma assigned our petition to the district court of Cleveland County for hearing. We have also brought an adjudication suit for water rights. This case is pending in the same district court and all party defendants have been notified.

The three cities, Norman, Midwest City, and Del City, Okla., which comprise the Central Oklahoma Water Users Association, presently secure their water from what is known as the Garber-Wellington structure, an aquifer composed of alternate layers of fine sandstone and shale about 400 feet thick. This structure produces a good grade of water, and in fair quantities. In Norman, the oldest of the cities where records of the wells have been kept over a long period of time, it was noted as early as the 1930's that the water table was beginning to drop. Records kept by the University of Oklahoma show that in 1929 the first producing horizon of this water was found at 229 feet. Without burdening you with details, the university drilled a well this past year, and the electric log taken at that time showed the top five sands to be dry. They are producing this well at a level of 430 feet. This leaves only about 200 feet of water available. That we are mining our water is self-evident. Naturally, this gives every informed person in the community concern. A surface supply was discussed as far back as 1936. It was not, however, until the early 1950's that legal machinery was developed whereby we could join hands with our sister cities who share a common problem in developing the resources of Little River, a stream producing large quantities of water which ultimately finds its way to the Gulf of Mexico. Our plea to you today is to help us turn this wasting resource into something of beneficial use.

The Little River in central Oklahoma (there are two streams called Little River in the State) originates in Cleveland and Oklahoma Counties. The area under immediate discussion comprises a watershed of 256 square miles, and it is estimated that it will supply adequate water for three cities, Norman, Del City, and Midwest City,

and Tinker Air Force Base for the next 50 years. It is proposed that irrigation will be supplied for several limited users downstream from the reservoir site. It will provide recreation beenfits on a regional and an interstate basis in an area are largely devoid of such facilities at the present time. It will provide fish and wildlife conservation benefits of both commercial and recreational significance. Flood control benefits are considered to be substantial. We would like to refer you to pages 86, 87, and 88 of House Document No. 420, 85th Congress, 2d session, for a report by the Corps of Engineers on this subject.

Senator ANDERSON. What sort of acreage is going to be handled by this irrigation?

Mr. COOKSEY. About 800, I believe. Mr. Barclay can give you that more in detail.

Senator ANDERSON. It is primarily municipal water?

Mr. COOKSEY. That is right.

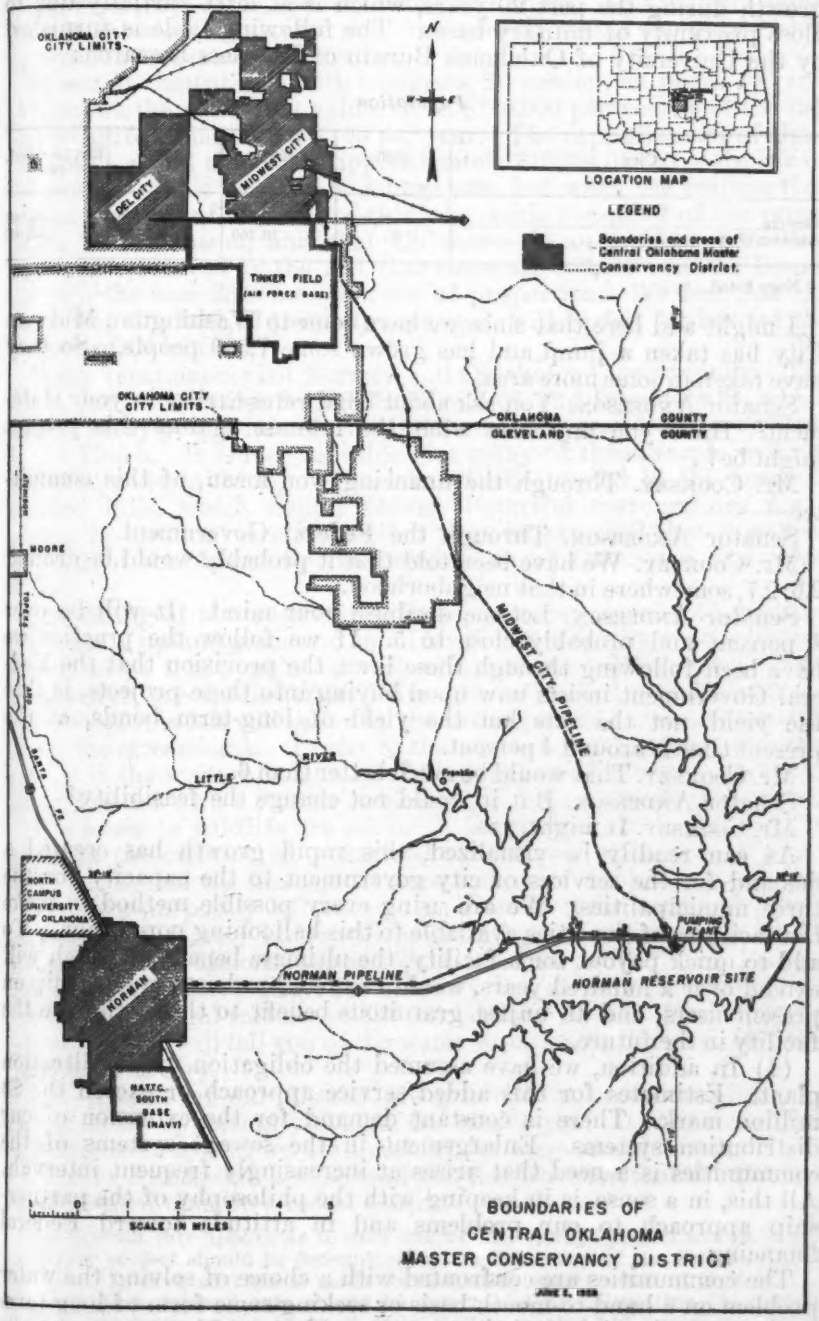
The plan contemplates the construction of a multiple-purpose reservoir and the necessary related works about 15 miles east of Norman. The plan is advanced as the Norman project on pages 443, 444, and 445 of the interagency report of the Arkansas-White-Red River Basins Interagency Committee, which report was completed in 1955 and forwarded to Congress in 1957 and printed as Senate Document No. 13, 85th Congress, 1st session. We are enclosing with this statement a map of the project that shows its relationship with the project cities.

Estimates of contractual water usage, copies of which are attached, have been arrived at by the various cities and users, which parallel the estimates of the Bureau of Reclamation. In the instance of the city of Norman, Okla., there are at present three units involved: (1) The city of Norman, (2) the University of Oklahoma, and (3) the Griffin Memorial Hospital. The general water supply situation in the various project cities will be developed by the city officials of the various cities in subsequent testimony, so it is not necessary to pursue it further here.

It might be of interest to the committee to know why we have requested our Representatives to introduce a bill which departs from the partnership approach in financing. The reasons are:

(1) The extremely fast rise in interest rates during the past few months: It is estimated by local brokers that self-liquidating bonds of the type required would have to bring approximately 6 percent on the present market.

(2) The normal course of bonds of this class is 25 years. This, together with the investment in a filtration plant, would make the obligation on a 25-year basis extremely difficult to repay and increase the cost of water beyond the point of maximum use.


OKLAHOMA CITY CITY LIMITS
DEL CITY
MIDWEST CITY
TINKER FIELD (AIR FORCE BASE)
OKLAHOMA CITY CITY LIMITS
OKLAHOMA COUNTY
CLEVELAND COUNTY
MOORE
MIDWEST CITY PIPELINE
LITTLE RIVER
NORTH CAMPUS UNIVERSITY OF OKLAHOMA
NORMAN
NAT'L. SOUTH BASE (NAVY)
NORMAN PIPELINE
PUMPING PLANT
NORMAN RESERVOIR SITE
LOCATION MAP
LEGEND
Boundaries and areas of Central Oklahoma Master Conservancy District.
SCALE IN MILES
BOUNDARIES OF
CENTRAL OKLAHOMA
MASTER CONSERVANCY DISTRICT

(3) The three cities in question have experienced a very rapid growth during the past 20 years, which is at least partially due to close proximity of military bases. The following table is furnished by the University of Oklahoma Bureau of Business Research:

Population

City	1940	1950	1959	Estimated, 1965
Norman	11,429	27,006	38,909	45,000
Midwest City	(1)	10,166	28,967	35,000

[1] None listed.

I might add here that since we have come to Washington, Midwest City has taken a jump and has grown some 7,500 people. So they have taken in some more area.

Senator ANDERSON. You ask about bond rates earlier in your statement. Have you any idea what the interest against this project might be?

Mr. COOKSEY. Through the financing, you mean, of this committee——

Senator ANDERSON. Through the Federal Government.

Mr. COOKSEY. We have been told that it probably would be around 2.6, 2.7, somewhere in that neighborhood.

Senator ANDERSON. Let me disabuse your mind. It will be over 4 percent and probably close to 5. If we follow the practice we have been following through these laws, the provision that the Federal Government insists now upon buying into these projects, is that the yield, not the rate but the yield of long-term bonds, at the present time is around 4 percent.

Mr. COOKSEY. That would be much better than 6.

Senator ANDERSON. But it would not change the feasibility?

Mr. COOKSEY. It might, yes.

As can readily be visualized, this rapid growth has created a demand for the services of city government to the capacity for the three municipalities. We are using every possible method to make the facilities of the cities available to this ballooning population. To add to quick payout for a facility, the ultimate benefit of which will extend over a hundred years, would create a burdensome hardship on present users, and an unjust gratuitous benefit to those who use the facility in the future.

(4) In addition, we have assumed the obligation of the filtration plant. Estimates for this added service approach or exceed the $3 million mark. There is constant demand for the extension of our distribution systems. Enlargement in the sewage systems of the communities is a need that arises at increasingly frequent intervals. All this, in a sense, is in keeping with the philosophy of the partnership approach to our problems and in attitude toward Federal financing.

The communities are confronted with a choice of solving the water problem on a hand-to-mouth basis or seeking some form of long-term financing and solving their water problems with an eye to the future. The only source presently available for financing this type of project is through the Federal Government. I might add, in addi-

tion to the testimony given in the written document, the cost of this project since the original appraisal in 1954, has increased somewhere in the neighborhood of approximately $4 million. This in itself represents a substantial increase and consequently makes the partnership approach much more burdensome.

House Document 420, 85th Congress, 2d session, on pages 106 and 118, shows the recreation values to be $110,000 per year, and the fish and wildlife values at $190,100 per year. The capitalization of these two items would amount to approximately $10,984,090 over the life of the project. This seems to be a huge sum, but when one realizes that within a radius of 50 miles of this lake reside one-third of the population of Oklahoma, and that Oklahoma is an outdoors-conscious State, as evidenced by the fact that there are 600,000 resident license holders, the sum does not seem out of proportion. We feel that the impact of this lake, if properly managed, will be felt far beyond the borders of Oklahoma.

Many vacationers visit Norman and Oklahoma City annually. The site is just a few miles from U.S. 77 and 66, and Interstate 35, which funnel many people into central Oklahoma each year from every State in the Union. It is inconceivable that many of these people will not stay for a day's fishing. The lake will be located in the heart of wooded hills, which should furnish beautiful surroundings for a spring or autumn vacation, and it is to be expected that it will be utilized to the fullest by the populations of Oklahoma and other States.

The filling of this reservoir will displace some species of wildlife, principally upland game and small birds. It is felt by most scientists that most of this population will adjust to the borderlands. There is, however, one species of bird life now in limited quantities in the area which it is felt will suffer by the cutting of the large cottonwoods along the streambank. I refer to the pileated woodpecker. For this bird, it is the western boundary of his range and, although the tributaries abound with a similar habitat, some loss to the area is certain.

The losses to wildlife are minor in comparison to the gains to be made in the creation of waterfowl habitat, the attraction of many shore birds, and the increase in some species of fur-bearing animals.

We have purposely left out of this discussion the technical phases of the presentation. These will be given by our engineer, Mr. C. H. Guernsey. Mr. Malone, our secretary-treasurer, will discuss Federal participation. Mr. Bailey, our attorney, has already presented testimony for the legal matters of the association. Messrs. Morris, Quinlan, and Trent will tell you of the water situation in Norman, Midwest City, and Del City.

The citizens of our district are grateful to your committee for giving us the opportunity to state our case to you. It is of the utmost importance to us and we are thankful for your consideration.

Senator ANDERSON. Let me read you the provision that the Government insisted upon in a recent project:

The interest rate applicable to each unit of this storage project and each participating project should be determined by the Secretary of the Treasury as of the time the first advance is made for initiating construction of said unit or project. Such interest rate should be determined by calculating the average yield to maturity on the basis of daily closing market bid quotations during the month of June next preceding the fiscal year in which said advance was

made on all interest-bearing marketable public debt obligations of the United States having a maturity date of 15 or more years from the first day of said month, and by adjusting such average annual yield to the nearest one-eighth of 1 percent.

I don't know what that would bring your interest rate to, but it would probably be 1¾ or 1⅞ now, and by the time of this project it will probably be around 4 percent.

Mr. Bennett, if you calculated this on a 4-percent basis, would that make some change in your figures?

Mr. BENNETT.[1] Certainly, on a 4-percent basis, keeping the years constant, it would increase the annual rate charged for water.

Senator ANDERSON. We figured one time at one of these projects, Boulder Dam would not be feasible. Bridge Canyon Dam would not be feasible. I could not find a project, nor could anybody connected with the committee find a project that would be feasible at the 4-percent rate.

I am just wondering what will happen to some of these projects unless we get through some legislation to provide some type of different rate than we have here.

Mr. COOKSEY. Mr. Chairman, we are in this particular position in this area: This is our only economically feasible area within the mileage that is possible for us to create a water project. So consequently it is just one of those things that we have to do.

Senator ANDERSON. I am not arguing that. I am merely saying to you that I do hope when you look at it you can face it from the standpoint of what the actual rates are likely to be. And it won't be any 2¾ percent basis.

Are there any questions?

(Mr. Cooksey presented the following communications for inclusion in the record:)

CITY OF DEL CITY, OKLA.,
August 7, 1959.

Mr. HAROLD COOKSEY.
President, Central Water Users Association,
Norman, Okla.

DEAR SIR: This will advise you that the City Council of Del City, Okla., passed a resolution July 13, 1959, agreeing to participate in the Little River-Norman project Oklahoma.

The average daily water consumption at present is 1 million gallons per day. By 1965 we would be taking from the Norman project 2 million gallons per day.

Very truly yours.

HUEY LONG, *City Manager.*

THE CITY OF MIDWEST CITY,
August 6, 1959.

Mr. HAROLD COOKSEY,
Chairman, Central Oklahoma Water Users Association,
Norman, Okla.

DEAR MR. COOKSEY: Attached is copy of resolution passed by the City Council of Midwest City, at a special meeting on August 5, 1959, at 7:30 p.m.

Sincerely,

ROBERT W. QUINLAN, *City Manager.*

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[1] N. B. Bennett, Assistant Commissioner of Reclamation.

RESOLUTION ON WATER CONTRACT WITH CENTRAL OKLAHOMA WATER CONSERVANCY DISTRICT

Whereas it is anticipated that the Norman project will be completed and ready for use by 1965; and

Whereas the city of Midwest City may purchase water for municipal supply through the proposed Central Oklahoma Master Conservancy District:

Therefore, the city of Midwest City would be willing to contract for 2,500,000 gallons per day or 912,500,000 gallons for the year 1965.

ORVILLE L. MATHEWS, *Mayor.*

CITY OF NORMAN,
Norman, Okla., August 3, 1959.

Mr. HAROLD COOKSEY,
President, Central Oklahoma Water Users Association,
Norman, Okla.

DEAR MR. COOKSEY: Whereas the Norman Reservoir project is expected to be completed and ready for use by the project cities by the year 1965, and whereas the city of Norman will be eligible to utilize water from this reservoir through the proposed Master Conservatory District organization, please be advised that the city of Norman will be willing to contract for a quantity of water in the amount of 2.4 million gallons per day or 876 million gallons for the year 1965.

Although the University of Oklahoma, the Central State Hospital and the NATTC are at this time producing water for their facilities from ground water sources the city of Norman will be willing also to serve these institutions through the Norman pipeline. However, if these institutions prefer to contract direct with the conservancy district for water the city of Norman will offer no objection to this procedure, provided the water sold to these institutions will be at a rate adequate to cover all costs of project construction, operation, maintenance and debt retirement.

Very truly yours,

G. L. MORRIS, *City Manager.*

Approved by the Norman City Commission this 3d day of August 1959.

[SEAL] JAMES F. LONG, *Mayor pro tem.*

Attest: D. R. WILCOX, *City Clerk.*

STATE OF OKLAHOMA,
DEPARTMENT OF MENTAL HEALTH,
CENTRAL STATE GRIFFIN MEMORIAL HOSPITAL,
Norman, Okla., August 1, 1959.

HAROLD S. COOKSEY,
President, Central Oklahoma Water Users Association,
Norman, Okla.

DEAR MR. COOKSEY: We of Central State Griffin Memorial Hospital have been reading a great deal lately about the progress being made in getting the Little River Dam project through Congress.

You and your associates handling this very important project are to be commended for the splendid job you have done up to date. We have all the faith in the world in you gentlemen completing this job with the aid, of course, of our very capable U.S. Senators and Representatives from this State.

I would like to inform you and your delegation, who as I understand are making a trip to Washington in the very near future, that Central State Hospital is very interested in this dam for its own benefit. It is the thinking of the officials of this institution that we will be one of your customers or users of water from this lake.

If any of us from Central State can be of any assistance to you or your committees in helping expedite legislation on this wonderful project, please advise.

Sincerely yours,

R. C. ADAIR, *Business Manager.*

THE UNIVERSITY OF OKLAHOMA,
Norman, Okla., July 30, 1959.

Mr. HAROLD S. COOKSEY,
President, Central Oklahoma Water Users Association,
Norman, Okla.

DEAR MR. COOKSEY: For some time the University of Oklahoma has been concerned about its present water supply. As you know, our supply of water presently comes from deep wells on the north campus, formerly the North Naval Base, and these wells penetrate the Garber-Wellington sandstone structure which produces a very high grade water. However, in logging these wells we have found that the water table has dropped substantially during the past years. Strata which formerly produced good quantities of water are no longer productive.

During the past year our consumption has amounted to 833,720 gallons per day. It is anticipated that during the next 10-year period there will be an increase of 30 percent in the enrollment of the university, which would in turn increase our consumption to approximately 1,100,000 gallons.

As an institution, we are tremendously interested in the Norman Lake project and are of the opinion that by the time it is completed we will be in need of additional sources of water. Accordingly, we look forward to the completion of the project and the finalizing of contractual arrangements for the purchase of water from your authority, either through the facilities of the city of Norman or direct with the Central Oklahoma Master Conservancy District, to meet our ever-increasing needs.

Sincerely yours,

G. L. CROSS, *President.*

THE CITY OF OKLAHOMA CITY,
Oklahoma City, Okla., July 21, 1959.

Mr. HAROLD S. COOKSEY,
President, Central Oklahoma Water Users Association,
Norman, Okla.

DEAR MR. COOKSEY: We have read with a great deal of interest your letters of July 8 and 20 in which you outline the sale of water to Oklahoma City from the proposed Norman Little River project. Your proposal No. 2, as outlined in your letter of July 8, 1959, of $100,000 set charge per year, plus a rate per thousand gallons of 1⅛ cents for water taken from the reservoir, is one upon which we could look with more favor than your first proposal of $300,000 per year flat charge.

It appears that this would be the proposal upon which we could reach an agreement, providing some of the details can be agreed upon at a later date.

As you know, the city council has contracted with Mr. C. E. Bretz, consulting engineer, who is rapidly bringing to a close his study for Oklahoma City's long-range water plans, and we look forward to working closely with your organization.

I feel sure you can count on us to participate in the Little River project hearing which we understand Senator Kerr is arranging before the Interior and Insular Affairs Committee of the Senate some time during July 1959.

Yours very truly,

SHELDON L. STIRLING, *City Manager.*

TINKER AIR FORCE BASE,
Oklahoma City, Okla., October 21, 1957.

Mr. HAROLD COOKSEY,
President, Central Oklahoma Water Users' Association,
Norman, Okla.

DEAR MR. COOKSEY: Since talking with you and General Muldrow, I have had a chance to appraise our interest in the Little River Dam project. Briefly our position remains much the same as it has been for several years. The proposed plan of development is considered feasible from an economic and engineering viewpoint and the schedule of water deliveries appears reasonable. The estimated industrial and domestic water consumption as outlined in the report for Tinker Air Force Base of 4.5 million gallons per day through the year 1970 is still compatible with programed missions for this installation.

Should the Little River Reservoir and/or the southeast Oklahoma project develop as presently proposed, the resulting water availability would be taken into consideration in our long-range planning. Any purchases or use of such water would, of course, be subject to mutually satisfactory negotiation as to quantities and price.

Our own wells are adequate for the predictable future but we are definitely interested in other sources to back up or supplement our water supply. The Little River Reservoir and the southeast Oklahoma project look promising. I understand these projects are complementary and that Oklahoma City officials support early approval and completion of the Little River Reservoir as a desirable step toward fulfillment of existing long-range plans.

Let me say I am favorably impressed with the aggressive attitude displayed by the Central Oklahoma Water Users' Association and Oklahoma City officials in working for long-range plans for an adequate supply of water for this part of the State. I would appreciate being kept informed on your progress.

Sincerely,

T. P. GERRITY,
Major General, USAF, Commander.

THE CITY OF OKLAHOMA CITY,
Oklahoma City, Okla., August 10, 1956.

Mr. IRA C. HUSKY,
Director, Water Resources Division,
Oklahoma Planning and Resources Board,
Oklahoma City, Okla.

DEAR MR. HUSKY: Confirming our telephone conversation of August 6, wish to advise that the city of Oklahoma City continues to maintain an active interest in the proposed construction of the Norman Little River water supply project.

The city would be very happy to cooperate in any way with the development of this projects, and, more specifically, we would be interested to assist in the development of this project at an early date.

We have previously discussed and are still interested in the use of any portion of the water which could be made available, at least until the southesat Oklahoma project water becomes available. Furthermore, it is entirely possible that the Norman Reservoir could be used as a balancing reservoir in connection with the long-range operation of the southeast Oklahoma project. Such an operation would no doubt be of mutual benefit to all parties concerned.

We have been advised that the discovery of oil in this area, together with the potential development in other areas, is likely to affect the possibility of going ahead with this construction. Any information you could give us in this connection would be appreciated. Will you keep us advised on any assistance we can render?

Cordially yours,

MORRISON B. CUNNINGHAM,
Director of Public Works.

Senator KERR. We have Mr. John Malone, manager of the Chamber of Commerce at Norman.

STATEMENT OF JOHN F. MALONE, MANAGER, CHAMBER OF COMMERCE, NORMAN, OKLA., SECRETARY OF THE CENTRAL OKLAHOMA WATER USERS ASSOCIATION

Mr. MALONE. Mr. Chairman and members of the committee, in the interests of conserving time I shall say only that the text of my testimony deals with some salient points concerning the jsutification for Federal participation in this project.

I can sum it up for you in about 30 seconds. I submitted the text of my testimony. As I mentioned, the principal points that are covered in this text I shall summarize as follows:

1. That the development of new water supplies is of tremendous socio-economic importance to each of our States and the Nation as a whole.

2. That the development of vast sources of municipal and industrial water is a prime factor in alleviating the growing pains of rural-to-urban migration and an increasing birth rate.

3. That Norman project, Oklahoma is a worth while venture which merits your assistance in helping to solve some of these problems.

4. That Federal participation in this project—fully justified on the basis of a regional or river basin concept—will produce benefits, substantially in excess of cost, which will accrue far beyond the limits of the project cities.

As I say, in the interests of conserving time I refer you to the full text which has been submitted and I shall be happy to answer any questions.

Senator ALLOTT. For a quick grasp of this: This, as I see the map presented with Mr. Cooksey's testimony, involves the dam which dams the Little River and what else?

Mr. MALONE. The dam, you will notice, is located in the lower right-hand corner: Little River, which starts up near Moore, Okla., and leads down here. There are several branches, creeks, also.

Senator ALLOTT. I wanted to get that clear in my mind.

Senator ANDERSON. The letter from the Bureau of the Budget refers to a large reservoir. This is the project you are now proposing?

Mr. MALONE. Yes, sir.

Senator ANDERSON. $13 million of Federal money and about $6 million of repayment?

Mr. MALONE. Yes, sir, this is the reappraisal value for the reservoir only.

In fact the figures are actually included in the statement. It provides for reimbursable costs to the Federal Government—the plan which we are proposing provides for reimbursable cost to the Federal Government of $11,115,000, allocated as municipal and industrial water supply for the project cities. The proposed nonreimbursable allocations for fish and wildlife conservation, flood control, recreation, and water for Tinker Air Force Base total $8,562,900.

Senator ANDERSON. The Air Force Base is a Federal installation?

Mr. MALONE. Yes, sir.

Senator ANDERSON. The Federal Government takes its share of that; doesn't it? Is the Federal share of this $13 million and the other share $6 million?

Mr. MALONE. The latest figures I have indicate that the reimbursable share is about $11 million. The nonreimbursable, including the water which would go to Tinker Air Force Base, is about $8½ million.

Senator ANDERSON. I would like to square up one statement. This is the Bureau of the Budget's report of August 11, 1959?

Mr. MALONE. Yes, sir.

Senator ANDERSON. That is really recent?

Mr. MALONE. Yes, sir.

Senator ANDERSON (reading):

Under the joint development favored by the Department of Interior in a report being submitted to your committee the Federal participation would be about $12,920,000, representing the cost of Norman Dam and Reservoir. Minimum basic recreational facilities, and that portion of the cost of the aqueduct system

allocable to furnishing water to Tinker Air Base. The remaining costs of $6,122,000 for distribution facilities would be the responsibility of the project water users.

Does that mean to you what it seems to mean to me, that $13 million would be the Federal Government's share and $6 million would be allocated to the project water users?

Mr. MALONE. Yes, sir.

Senator ALLOTT (presiding). Have you any questions, Senator Kuchel?

Senator KUCHEL. The suggestion in your statement that part of the reservoir which would service Tinker Air Force Base would be among the nonreimbursable features may not in the concept of the Budget Bureau be correct; isn't that so?

It has nothing to do with the feasibility of the project. But it is true that this language to which the Senator from New Mexico just referred may indicate that in the Budget Bureau's prospect of what constitutes reimbursable features——

Mr. MALONE. Yes, sir.

Senator KUCHEL. What is the difference between the size and capacity of the reservoir as you speak of it in your prepared statement and that which apparently the Department of Interior has contemplated as an alternative?

Mr. MALONE. If I understand you correctly, sir, this original report, which was prepared by the Department of Interior and the Bureau of Reclamation, originally anticipated a lake which would come to elevation 1039, I believe, and this new proposal contemplates raising that about 5 feet, it is my understanding.

Senator KUCHEL. What is the position of the people in the area with respect to the larger facility?

Mr. MALONE. It is favorable, sir.

Senator KUCHEL. Thank you, Mr. Chairman.

(The prepared statement of Mr. Malone follows:)

STATEMENT OF JOHN F. MALONE, SECRETARY, CENTRAL OKLAHOMA WATER USERS ASSOCIATION

Mr. Chairman and members of the committee, my name is John F. Malone, of of Norman, Okla. I am manager of the chamber of commerce in that city, and I am also serving as secretary of the Central Oklahoma Water Users Association. My assignment at this hearing is to present some salient points which support justification for Federal participation in the Norman project, Oklahoma.

"If we are to continue to advance agriculturally and industrially, we must make the best use of every drop of water which falls on our soil, or can be extracted from the oceans."

This statement, made by President Dwight D. Eisenhower when he appointed the Advisory Committee on Water Resources Policy in 1955, is the opening quotation in a recent report prepared by the University of Oklahoma Bureau of Water Resources Research; titled, "Water: Oklahoma's No. 1 Problem." The research and findings of the Bureau not only substantiate the President's statement, they strongly point to the fact that in Oklahoma, an area of weather extremes, the statement has far more serious connotations than in many other parts of the United States.

As you gentlemen know, municipalities throughout the country have been plagued in recent years with tremendous problems created by a general migration of people from the rural areas to the urban centers. Sociologists and economists advise us that the trend will continue for many decades to come. And our problems will be compounded by an ever-increasing birth rate. In Oklahoma this rural-to-urban migration is borne out by the fact that in 1930 a total of 1,575,000 people resided in rural communities, while the remaining 822,000 lived in towns and cities. But by 1950, only 1,094,000 people were living

in the rural areas. The city populations, on the other hand, had increased to 1,140,000.

The University of Oklahoma study has this to say about the situation:

"An extension of the rates of increase in urban population indicates that by 1960 municipal demand for water will exceed 277 million gallons per day. And 326 million gallons per day will be required 5 years later. By 1970, nearly 380 million gallons will be required daily, and the level will reach 419 million gallons daily by 1975."

Gentlemen, we do not mean to imply by the presentation of these facts that the water problem in Oklahoma is unique. We realize certainly that each of you represent a State in the Union. We know too that each of these States is confronted with similar problems. Even those States with huge supplies of ground and surface waters are scratching their heads as they contemplate the future. We have a common problem. And it is a national problem. One of the major aspects of this problem is how we are going to create job opportunities and provide a new means of livelihood in the cities for our rural neighbors who are being thrust into our urban centers by farm mechanization.

The problems in your State are the same problems we have in Oklahoma. They differ only in degree and locale. The problem at hand relates to people, their welfare, and our stature as a nation. It is a human problem, involving individual and collective status. In my State we are trying to help these people who are migrating to the cities by calling upon the business brains of our communities to launch new industries and expand present industrial facilities. We are urging them to meet the challenge of this technological age and provide new jobs for the people who are being born into, or are migrating into, our communities. I am sure that the cities in your home State are doing likewise.

But launching an industry in the community is not a simple matter. Our free enterprise system requires that the venture must be profitable, if it is to be competitive. This, in turn, demands that industry consider such important factors as markets, raw materials, transportation, labor supply, power, fuel, and water, if it is to be successful. Again, referring to the University of Oklahoma report, there is this to be said about industrial water:

"Many Oklahomans have made determined efforts to further promote industrial expansion within the State. Thus far, these efforts have met with only moderate success. However, continued accomplishments along this line will depend largely upon the ability of the communities within the State to provide ample amounts of industrial water. In most cases, manufacturers prefer surface water as a primary source of supply. It is more economical to obtain, and from a quantity standpoint is generally more trustworthy than ground water. Moreover, surface water can be more accurately inventoried at any given time. Ground water, when expended, is difficult to replace, but is valuable for standby or emergency use, when available in quantities."

And so, gentlemen, we present our case: We are three project cities with typically urban-American growing pains. Our names in Oklahoma are Del City, Midwest City, and Norman. We also have another partner in our complex—not incorporated—not taxpaying—not entirely civilian—but far more important to our national security. This is Tinker Air Force Base, a sprawling military installation of some 23,000 personnel, which services and supplies ships and materiel of our Air Command throughout the world. We are the principals who are pleading the case for construction of a dam and reservoir on Little River in central Oklahoma. We have quite a lot in common. We are a relatively new breed, sometimes called the mushrooming suburbia of Metropolitan America. To date we have sucked our sustenance from wells sunk in a common aquifer. But now we are genuinely alarmed with reports of a falling water table, and we believe that to continue to rely completely upon underground water is a gamble. We think our future deserves better insurance. We believe a surface water supply is the soundest approach.

Since this situation is part of a national problem, and because watersheds, tributaries, and major water arteries throughout the country are all interrelated, and since the Norman project is a part of the Arkansas Basin which cuts across State lines, it seems reasonable and logical that Federal participation is thoroughly justified. This is further supported by the report of the Arkansas-White-Red River Basins Interagency Committee established pursuant to the Flood Control Act of 1950.

As our Nation has grown, as our social, economic, and military requirements have become more complex, and as our cities and States have become more interdependent, our people and our resources have, of necessity, become more and

more of a mutual problem which can be successfully coordinated only at the national level.

In respect to water resources and development, it seems clear that Congress has come to recognize the necessity of developing plans based upon the river basin or regional approach. Certainly, it is not feasible for a city (or some other local unit of government) to develop an entire basin by itself. Nor would it be fair or reasonable to expect the public (represented by other units of government in the basin) to accept an alteration of water conditions in the area, when imposed by a single unit of the system. Reservoir sites developed locally, and without benefit of regional planning, take into consideration only the immediate needs of a small segment of population. Consequently, the project serves a limited purpose and results in underdevelopment. This is a disservice to the public as a whole. The public good is best served when reservoir sites are developed for maximum use through multipurpose projects planned, coordinated, and sponsored by responsible agencies of the Federal Government as a component part of total development within a region or basin.

It is upon such a plan as this that the Norman project is predicated. It provides for reimbursable cost to the Federal Government of $11,115,000 allocated as municipal and industrial water supply for the project cities. Proposed nonreimbursable allocations for fish and wildlife conservation, flood control, recreation, and water for Tinker Air Force Base total $8,562,900. Total annual monetary benefits would average 1,770,200. The resulting benefit-cost ratio would be 2.46 to 1. Because of these far-reaching benefits, we believe this is a further justification for Federal participation in our project.

In closing, I should like to underscore the point that this joint project is among the first in a newly emerging concept of area development. Heretofore, cities have thought of development and progress in an individual sense. But now, with interstate highways, jet transportation, and burgeoning populations, we are literally growing together. Therefore, it seems apparent that if we are to plan our growth in an orderly fashion, we must work together on a national scale toward the solution of our mutual problems. In Oklahoma, our No. 1 problem is water, and in central Oklahoma, our No. 1 project is Norman project, Oklahoma.

This concludes my testimony. In recapitulation, I hope that you will find these four points worthy of our consideration:

(1) That the development of new water supplies is of tremendous socio-economic importance to each of our States and the Nation as a whole.

(2) That the development of vast sources of municipal and industrial water is a prime factor in alleviating the growing pains of rural-to-urban migration and an increasing birthrate.

(3) That Norman project, Oklahoma, is a worthwhile venture which merits your assistance in helping to solve some of these problems.

(4) That Federal participation in this project, fully justified on the basis of a regional or river basin concept, will produce benefits, substantially in excess of cost, which will accrue far beyond the limits of the project cities.

Senator ALLOTT. Senator Kerr, who is your next witness?

Senator KERR. Mr. Grover Morris, city manager, Norman, Okla.

STATEMENT OF GROVER MORRIS, CITY MANAGER, NORMAN, OKLA.

Mr. MORRIS. I am Grover L. Morris, city manager of Norman, Okla. I am appearing before this committee at the request of the Norman City Commission, on the authorization which is on the second page of the report.

I have only a few comments other than what is shown in the report. If you have any questions about this report as I go along I would appreciate your asking me about it. However, to sum it up, Norman is dependent upon the ground water source which is rapidly being depleted.

The difficulties of production and cost of production of water from this in our area are getting quite high. The water rights that we secure for ground water are getting more difficult to obtain. We must

obtain these water rights from individual property owners. The costs of these ground water rights and the deals that we have to make on the water are fast becoming beyond the city's capacity to sustain.

The Norman Little River project seems to be the only answer to our central Oklahoma water supply situation. It is the most economical for development as far as Norman is concerned. We would appreciate any assistance on this project that we can obtain. We feel that this project will be developed, regardless of how it is financed. It will be developed in some form in the future. We do need this water now.

Norman's growth is certainly depending upon it. The University of Oklahoma's growth and future is depending upon it. The central Oklahoma area, which also includes Oklahoma City, Del City, and Midwest City, and as mentioned, Tinker Air Force Base, will depend upon this water.

We have gone through a recent wet cycle of 2½ years. Our water supply demands have gotten through the last summers in that those demands have decreased somewhat over demands in normal and drouth periods. But we cannot depend upon a sustained wet cycle. When we go into the next drought cycle we will be in very serious trouble.

The water level, the water table, is lowering to the extent that we are beginning to get intrusion of mineralized water. Certainly the Senator from California knows what that means.

Senator KUCHEL. How deep are those wells?

Mr. MORRIS. Ours average 625 feet deep in sandstone.

And the water softness at the time these wells were originally developed was around 20 to 30 parts to the million of hardness. Now the hardness is up to 50 to 140, and gradually increasing.

I brought down records, as you will see on this log, which show that our water supply situation is very serious. That is about the extent of my explanation. We have the need and we have the method of solving our needs.

We are asking for your assistance in bringing about a cooperative solution of this problem.

Senator ALLOTT. You are now pumping at something like 550 feet?

Mr. MORRIS. Yes, sir.

Senator ALLOTT. What source of power do you have there and what do you pay for it?

Mr. MORRIS. We are using electric power from the Oklahoma Gas & Electric Co.

Senator ALLOTT. What do you pay for it?

Mr. MORRIS. Our power rate, on a combined basis, will average out just over 7 mills per kilowatt-hour.

Senator KERR. You are talking about the rate the city pays?

Mr. MORRIS. That is correct, sir. That is quite different than what the public will pay, in that the city—O.G. & E. is operating under city franchise.

Senator KERR. Would you tell the committee the population of Norman, Del City, Midwest City, Tinker Air Force Base, and the general area which ultimately will draw upon this for a water supply?

Mr. MORRIS. Norman's present population is calculated at 39,200. The other fellows will give their own cities, but I think that Midwest City is now calculated at 28,000.

It is 35,000 as of today, I am advised.

Del City is 15,000.

Our growth is dependent entirely upon water. There is no limitation to the growth of the central Oklahoma area provided there is sufficient water. That is the limitation.

Senator KERR. Thank you very much, Mr. Morris.

(The report referred to by Mr. Morris is as follows:)

CITY OF NORMAN (OKLA.) REPORT ON THE NORMAN RESERVOIR PROJECT

EXCERPT FROM CITY COMMISSION MINUTES OF JULY 14, 1959, NORMAN, OKLA.

The manager stated that the Little River project hearing is scheduled to be held in Washington, D.C., some time later in the month and that the city should have a representative at the hearing. He stated that Mr. Harold Cooksey, Mr. John Malone, representing the chamber of commerce, and Mr. Bob Bailey, representing the Governor, are going to attend.

A motion was made by Commissioner Long, seconded by Commissioner McNabb, that the manager be delegated to represent the city of Norman at the hearing in Washington, at the city's expense. Roll was called with the following result:

Ayes: Commissioners Hemphill, Jansing, Long, McNabb, Reynolds, Ryan, and Mayor Benson.

Nays: None.

I, D. K. Wilcox, the duly qualified and acting city clerk of the city of Norman, Okla., do hereby certify the above to be a true and correct excerpt from the minutes of the regular meeting of the city commission of said city of Norman, Okla., held on the 14th day of July 1959. I do further certify that Grover L. Morris is the city manager of Norman, Okla.

[SEAL] D. K. WILCOX, *City Clerk.*

CITY OF NORMAN REPORT ON NORMAN RESERVOIR PROJECT, CLEVELAND COUNTY OKLA., JULY 22, 1959

The city of Norman obtains water from 18 wells tapping the Garber sandstone and Wellington formation, both of Permian age. These formations consist of alternating beds of shale and fine-grained sandstone and constitute the most important aquifer in central Oklahoma. They dip gently westward and form a confined aquifer 300 feet thick in the Norman area which is tapped by wells up to 800 feet deep. Although transmissibilities are low and drawdowns great, some wells yield as much as 300 gallons per minute, and wells yielding more than 100 gallons per minute are common.

The water is moderately hard in the outcrop area but is generally soft downdip and is of the sodium bicarbonate type. Farther downdip, in McClain County and the southwestern part of Oklahoma County, the sandstones grade into shale, and water in the Garber and Wellington is highly mineralized.

The 18 city of Norman wells average 620 feet in depth and are equipped with electric-driven vertical turbine pumps which are set at 550 feet below the ground surface. The average production from these wells is 156 gallons per minute or a total of 225,000 gallons per day each. The total maximum production from all 18 wells is 4.05 million gallons per day if pumped continuously. The actual daily production on a yearly basis is somewhat less than this figure as allowance must be made for shutdown time due to mechanical failures and excessive drawdown.

The American Water Works Association recommends that a city such as Norman should have a daily pumping capacity three to four times the average daily requirements for water. Thus with an average daily pumpage of 2 million gallons per day for the past year, Norman should have at this time a minimum of 6 to 8 million gallons per day available to maintain good service and adequate fire protection during peak periods of water use.

Table I shows the withdrawal of water by the city of Norman for the years 1941 to 1959.

Table II shows the total water withdrawn from the area for public uses during the year 1955.

TABLE I.—*Water pumped by city of Norman from city wells*

Year	Million gallons	Average, million gallons per day	Year	Million gallons	Average, million gallons per day
1940			1950	456.029	1.25
1941	286.381	0.79	1951	494.111	1.35
1942	364.986	1.00	1952	527.689	1.44
1943	369.429	1.02	1953	586.515	1.61
1944	372.739	1.02	1954	649.504	1.78
1945	384.895	1.06	1955 [1]	586.334	1.61
1946	400.006	1.10	1956	702.497	1.93
1947	467.310	1.28	1957	660.189	1.81
1948	541.841	1.48	1958	697.847	1.91
1949	457.803	1.26	1959 [2]	710.000	1.95

[1] The year 1955 is typical in showing that the Norman supply is less than ½ of the water used for public purposes as shown below.
[2] Estimated.

TABLE II.—*Water pumped from Norman area, year 1955*

	Million gallons	Percent
City of Norman	586.334	48
University of Oklahoma	218.126	17
Central State Hospital	312.000	25
NATTC	130.354	10
Total (public)	1,246.814	100

In addition to public use of water from the Garber-Wellington formations there are a large number of private wells tapping these same formations which further deplete the aquifer and magnify the shortage of water in the area.

The growth of Norman has been tremendous since the end of World War II as shown on figure 1. During the period from 1946 to 1958 the population has increased 102 percent. The number of water meters in service has increased 107 percent and the total water pumped has increased 96 percent. During the past 8 years the land area within the city limits has increased 56.3 percent.

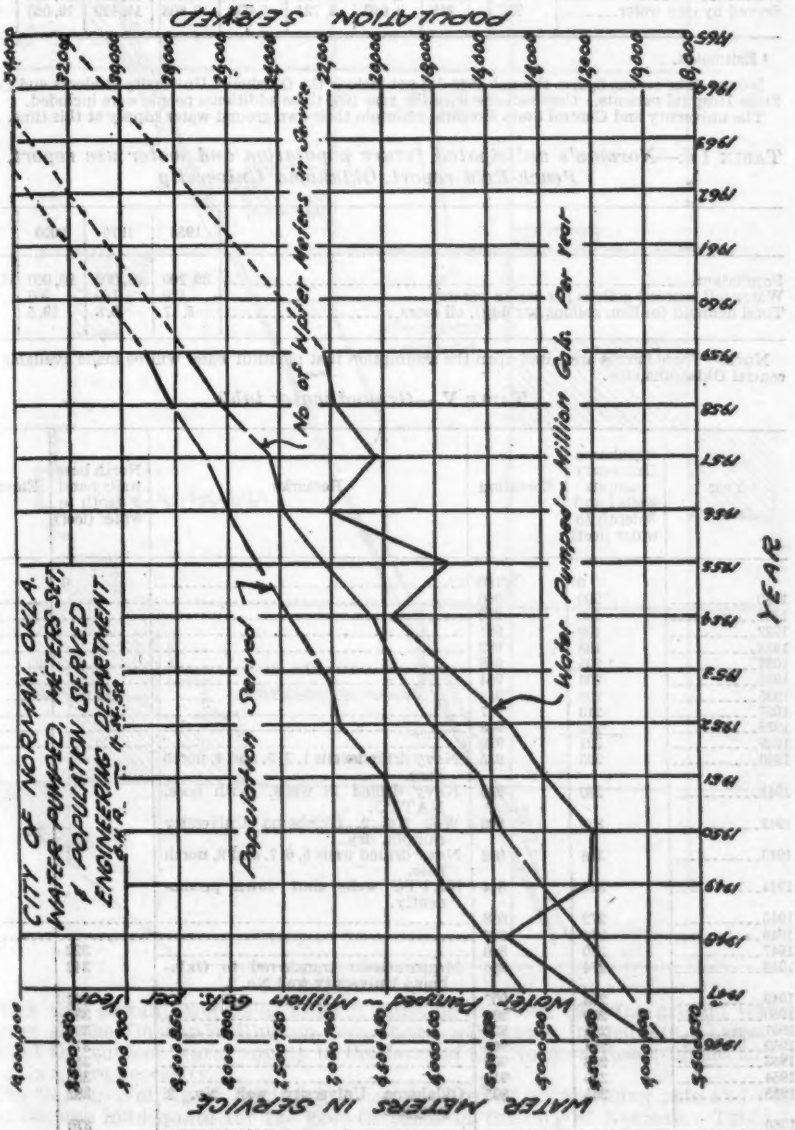

CITY OF NORMAN, OKLA.
WATER PUMPED, METERS SET,
& POPULATION SERVED
ENGINEERING DEPARTMENT
S.N.A. — 4-25-58
Population Served
No of Water Meters in Service
Water Pumped — Million Gals. Per Year
POPULATION SERVED
WATER METERS IN SERVICE
YEAR

FIGURE 1

TABLE III.—*Population of Norman*

City	1890	1900	1907	1910	1920	1930	1940	1950	1959 [1]
Norman	787	2,225	3,040	3,724	5,004	9,603	11,429	27,006	39,300
Served by city water	787	2,225	3,040	3,724	5,004	9,603	11,429	19,050	29,000

[1] Estimated.

NOTE.—The census figures through 1940 did not include the Oklahoma University students and Central State Hospital patients. Commencing with the year 1950 these additional people were included. The university and Central State Hospital maintain their own ground water supply at this time.

TABLE IV.—*Norman's anticipated future population and water use report, 1958 Peach-Reid report, Oklahoma University*

	1958	1975	2000	2025
Population	39,200	61,000	95,000	129,000
Water (all sources) gallons per capita per day	110	160	206	250
Total demand (million gallons per day), all users	5.17	9.8	19.5	32.2

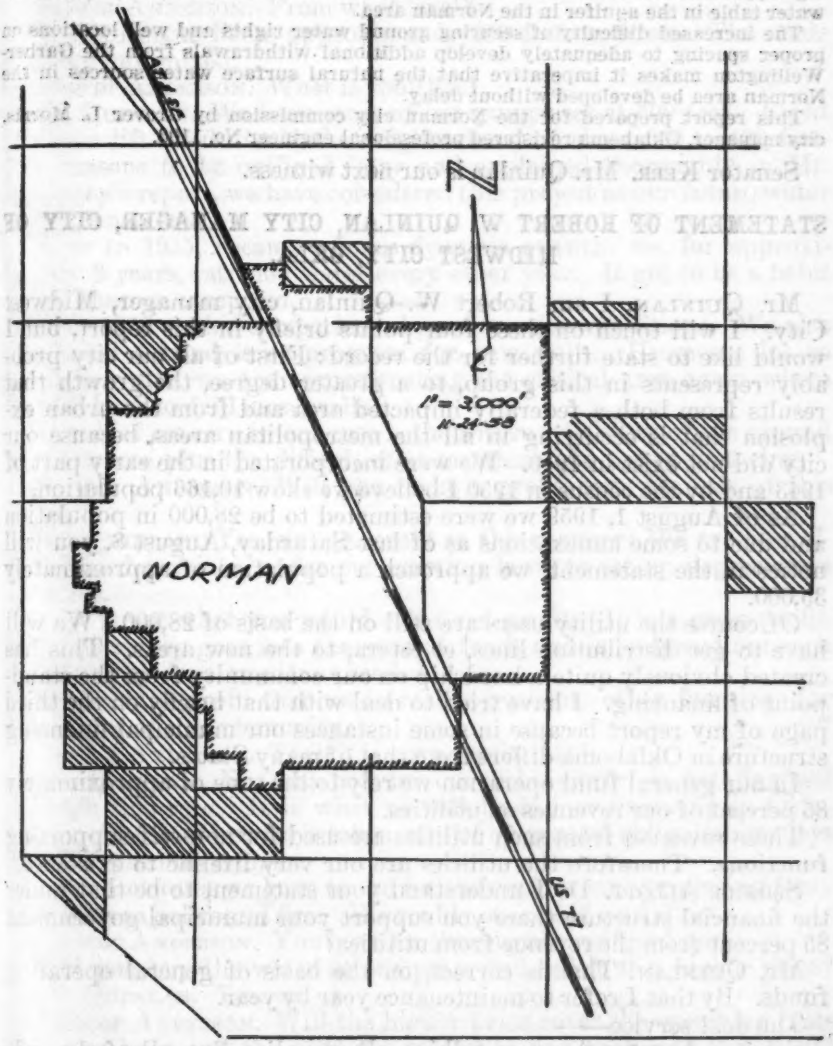
NOTE.—These figures are based upon the assumption that plentiful water will be made available to the central Oklahoma area.

TABLE V.—*Ground water table*

Year	Oklahoma University campus wells 1 and 2 depth to water (feet)	Elevation	Remarks	North base wells 1 and 2 depth to water (feet)	Elevation
	0	1,160		0	1,186
1930	200	960			
1931	200	960			
1932	199	961			
1933	198	962			
1934	202	958			
1935	206	954			
1936	208	952			
1937	213	947			
1938	217	943			
1939	221	939			
1940	225	935	Navy drilled wells 1, 2, 3, and 4, north base.		
1941	230	930	Navy drilled 18 wells, south base, NATTC.		
1942	360	800	Well No. 2, Oklahoma University campus, dry.		
1943	358	802	Navy drilled wells 5, 6, 7, and 8, north base.		
1944	316	844	NATTC wells shut down permanently.		
1945	272	888			
1946	274	886			
1947	280	880		322	864
1948	274	886	Measurements transferred to Oklahoma University well No. 2.	342	844
1949	253	907		362	824
1950	250	905		382	804
1951	264	896		396	780
1952	254	906		377	809
1953	258	902		354	832
1954	250	910		356	830
1955	265	895	Oklahoma University well No. 2 plugged.	382	804
1956				370	816
1957				386	800
1958				430	756
1959				426	760

The land area within and adjacent to Norman, which is either under development at this time or under option for development, as shown in figure 2, is sufficient to accommodate 4,500 new homes at the present intensity of development. This many homes represent 16,000 additional people, which in turn represent an increase in the demand for water of 2 million gallons per day.

FIGURE 2



With this certain growth at hand it must be assumed that the ground water sources of the Garber-Wellington formations will prove inadequate. Development of the surface water supply in the form of the Norman Reservoir on Little River is a dire necessity.

The Garber-Wellington aquifer is being depleted at an alarming rate and will soon become inadequate for the growth needs of the city of Norman. Table V shows this depletion as it pertains to the ground water table. These figures are from the University of Oklahoma records from Oklahoma University wells No. 1 and No. 2 on the main campus and wells No. 1, No. 2, and No. 3 on the north campus.

Figure 3[1] is a gamma ray-neutron log of water well No. 7–A located on the north campus (north base) of the University of Oklahoma. This log indicates the dry water strata which produced water prior to World War II. This well

[1] Filed with the committee for reference purposes.

log supplements the information in table V and shows the serious lowering of the water table in the aquifer in the Norman area.

The increased difficulty of securing ground water rights and well locations on proper spacing to adequately develop additional withdrawals from the Garber-Wellington makes it imperative that the natural surface water sources in the Norman area be developed without delay.

This report prepared for the Norman city commission by Grover L. Morris, city manager, Oklahoma registered professional engineer No. 1103.

Senator KERR. Mr. Quinlan is our next witness.

STATEMENT OF ROBERT W. QUINLAN, CITY MANAGER, CITY OF MIDWEST CITY, OKLA.

Mr. QUINLAN. I am Robert W. Quinlan, city manager, Midwest City. I will touch on these four points briefly in this report, but I would like to state further for the record: First of all our city probably represents in this group, to a greater degree, the growth that results from both a federally impacted area and from the urban explosion that is occurring in all the metropolitan areas, because our city did not exist in 1940. We were incorporated in the early part of 1943 and by the census in 1950 I believe we show 10,166 population.

As of August 1, 1959 we were estimated to be 28,000 in population and due to some annexations as of last Saturday, August 8, you will notice in the statement, we approach a population of approximately 35,000.

Of course the utility users are still on the basis of 28,000. We will have to get distribution lines, et cetera, to the new areas. This has created obviously quite a hardship on our community from the standpoint of financing. I have tried to deal with that briefly on the third page of my report because in some instances our municipal financing structure in Oklahoma differs from that of many States.

In our general fund operation we rely to the tune of approximately 85 percent of our revenues on utilities.

These revenues from such utilities are used for non-self-supporting functions. Therefore the utilities are our very lifeline to existence.

Senator ALLOTT. Do I understand your statement to be that under the financial structure there you support your municipal government 85 percent from the revenue from utilities?

Mr. QUINLAN. That is correct, on the basis of general operating funds. By that I refer to maintenance year by year.

The debt service——

Senator ALLOTT. Are you talking about police, fire, all of the ordinary general expenses of the city being financed from the utility fund?

Mr. QUINLAN. To the tune of about 85 percent, yes, sir.

Although our yield is somewhat greater per well than Mr. Morris has explained in the case of Norman, our water tests indicate a greater hardness. Our hardness runs in the neighborhood of 200 parts per million.

Senator ANDERSON (presiding). Two hundred?

Mr. QUINLAN. Yes, sir. That is a conglommerate. Our wells are constructed to a depth in most cases of approximately 750 feet deep. The nature of the construction is casing, cement from bottom to top, and then we perforate and we run a gamma ray neutron log. We perforate the water bearing sands.

Senator ANDERSON. From what level?

Mr. QUINLAN. From approximately 300 feet on down. The sands are very intermixed.

Senator ANDERSON. What is your lift?

Mr. QUINLAN. We have most of our pumps set at 500 feet. Right now our lift would be in the neighborhood of about 350 to 400 feet. For reasons to be outlined later and explained thoroughly in Mr. Guernsey's report, we have considered this project as our future water supply since 1953.

Prior to 1955, because of our dynamic growth, we, for approximately 8 years, rationed water every other year. It got to be a habit rather than an exception.

Since 1955 we have experienced good weather conditions. We also completed a bond issue program for new wells. However, due to recent growths we are approximating the critical area again where we will have to drill more wells.

Our chief concern in our case is the future reliability of the ground water source plus the difficulties as mentioned before in financing.

Senator ANDERSON. Will you make a profit from the sale of this water?

Mr. QUINLAN. Yes, sir. A profit in this manner: We are now allowed to depreciate, under our existing laws, to set up depreciation accounts.

So it is not what you would call a net profit. It is a gross profit. But this money goes into the general funds and is budgeted out each fiscal year by departments as needed.

In effect the profit that we do realize goes into other functions for the service of the community.

Senator ANDERSON. Then it is not a profit, is it?

Mr. QUINLAN. No, sir; because our debt service is not financed through this rate. It is what we call back-door financing in Oklahoma. The debt service is taken care of by general obligation moneys for all capital investment.

The water rates we have to use for the non-revenue-producing function, such as police and fire. We could not exist if we did not.

Senator ANDERSON. You have me thoroughly confused now.

Will you buy the water at one price and sell it at a higher price?

Mr. QUINLAN. Yes, sir.

Senator ANDERSON. Will the higher price cover the operating costs that you have and the need for money to pay back into this fund?

Mr. QUINLAN. Yes, sir.

Senator ANDERSON. Will you then have a profit?

Mr. QUINLAN. No, sir.

Senator ALLOTT. Now you have me confused.

Mr. QUINLAN. Maybe I should explain it in this manner:

We can operate it under our existing—I did not want to get you confused; we are confused enough in Oklahoma——

Senator ANDERSON. If you have just an ordinary cashbook and you take in so much in a day and spend so much in a day, you know at the end of the day whether you have made money or lost it?

Mr. QUINLAN. Yes, sir.

Senator ANDERSON. You have to adjust it for inventories and a lot of other things?

Mr. QUINLAN. Yes, sir; but, one, we cannot set up depreciation accounts to take care of equipment, which will depreciate in our water utility.

Two, our capital investments in our water utility are financed through general obligation bonds, and that is tax bonds.

Senator ANDERSON. That is the distribution system?

Mr. QUINLAN. Yes, sir; but it is a part of the utility.

Senator ANDERSON. But you are coming into a project here that will run into a lot of money?

Mr. QUINLAN. Yes, sir. We will purchase——

Senator ANDERSON. What bothers me is that "Gentlemen, we are not asking for a grant or a giveaway program, we are merely asking for a loan which we will repay with interest through the purchase of water."

The figures show that of the $19 million, the Federal Government will put up $13 million and the local water users will put up $6 million.

Is there any grant connected with that?

Mr. QUINLAN. I think not, on the basis of the municipal use. We will pay for the water as purchased through the conservancy district.

Senator KUCHEL. Will the Senator yield?

Senator ANDERSON. Yes.

Senator KUCHEL. I observe in the report of the Department of the Interior a sentence:

> The city's repayment obligation under the joint development plan would be $4,851,000, and under the all-Federal plan $11,115,000, which would be repaid with interest within 50 years as the bill provides.

You favor the all-Federal plan, do you not?

Mr. QUINLAN. Yes, sir.

Senator KUCHEL. Would it be fair to say then that that does represent the amount that would be repaid?

Senator ANDERSON. No. The Federal Government is—I am not objecting to it but the Federal Government is charging off so much for wildlife preservation, so much for recreation facilities for running the power around the lake, so much for taking care of Tinker Air Force Base, and we finally come down to $6 million. That is not unusual.

We do it in all sorts of projects. I am not worried about it. I am merely trying to find out how much it is. You said there would be no profit at all to the city in the sale of the water?

Mr. QUINLAN. I said there would be no profit at all.

Senator ANDERSON. Yes.

Mr. QUINLAN. From our financing standpoint there would be no profit in the sense that all of this money is returned to our community to maintain the city hall, pay the police and so forth, in lieu of taxes.

Senator ANDERSON. Isn't that a profit?

Mr. QUINLAN. Well, Senator, under our State laws we receive—let me state it in this manner: Our budget this year, general operating budget this year, is some $750,000. From this, or a part of this, we receive in taxes approximately $30,000.

Senator ANDERSON. From the property tax?

Mr. QUINLAN. Yes, sir.

Senator ANDERSON. And $720,000 from other items?

Mr. QUINLAN. $720,000 has to be made up from our utilities, which we consider our sewers, sanitation—garbage refuse—and our water, the utilities.

Senator ALLOTT. Let me ask you a question.

I think what the Senator is trying to get at, and I am only trying to get at from a different standpoint, is this: If the Federal Government is supplying $13 million, and the water users supply $6 million, the Federal Government is supplying roughly $2 for $1 on this project.

Is that right?

Mr. QUINLAN. Yes, sir.

Senator ALLOTT. You propose to take the water out of it and buy it at a certain price and sell it at a raised price. This raised price does not simply cover the water, the lines, the pumps, the distribution. It also covers a plus factor which is the cost of administering government; is that right?

Mr. QUINLAN. Yes, sir.

Senator ALLOTT. So to that extent the Government——

Mr. QUINLAN. Not completely, Senator.

Senator ALLOTT. To 85 percent?

Mr. QUINLAN. No; not the water utility alone. This represents all of our utilities.

Senator ALLOTT. Water and other utilities?

Mr. QUINLAN. Yes, sir.

Senator ALLOTT. So to that extent, whatever that proportion is, the Federal Government is financing that part of the cost of running your city government on the basis of $2 for $1, that is the point, isn't it?

Mr. QUINLAN. Now I am confused.

Senator ANDERSON. As long as he and I understand it, that is a good point to stop.

Mr. MORRIS. May I make a comment on that?

Senator ANDERSON. Yes.

Come on up.

Mr. MORRIS. There is something I would like to clear up.

Senator ANDERSON. State it for the record.

Mr. MORRIS. I am Grover Morris, from Norman. You are implying that the Federal Government will be subsidizing local government operations, and that is not the fact. The fact is that all the nonreimbursable moneys of this project will be paid for by the project cities out of the costs that they pay for the water.

Senator ANDERSON. All the nonreimbursable items will be paid for by the cities?

Mr. MORRIS. Yes, sir.

Senator ANDERSON. Wait a minute. Let's clear that up.

Is that right, Mr. Bennett?

Do you agree with that statement?

Mr. BENNETT. I am sorry, we cannot hear.

Senator ANDERSON. He said the nonreimbursable items——

Mr. MORRIS. Reimbursable items.

Senator ANDERSON. There is a little difference there.

Mr. MORRIS. There is $6 million reimbursable.

Senator ANDERSON. But you said "reimbursable."

He will read back what you said. It just does not make any sense. The nonreimbursable items are not paid for by the city. We all understand that.

Mr. MORRIS. Yes, sir; that is right.

Senator ANDERSON. The question had to do with the nonreimbursable items, where there is a reasonable chargeoff. That is what I was trying to get to. It is not unusual in an irrigation project to have nonreimbursable items for flood control and fish and wildlife resources.

We would not have built most of our projects if we had not had those in. I am trying to find out at what scale they were put in. Go ahead, sir.

Mr. MORRIS. Reimbursable items in which the cities will participate certainly will be paid back by what the cities pay the purchaser of the water.

Senator ANDERSON. They would not be called reimbursable if they would not be paid back.

Isn't that what reimbursable means?

Mr. MORRIS. Yes, sir. It seems to me that——

Senator ANDERSON. You helped us clear up the other point.

Mr. QUINLAN. I am not clear on the 2 to 1 ratio.

Senator ANDERSON. It is plain arithmetic. It is grade school arithmetic, isn't it?

If one fellow puts in $13 million, and the other fellow puts in $6 million, aren't they putting in money at the ratio of 2 for one and 1 for the other?

If you don't pay back the Government we will never get it back.

In order to make the project feasible you have to build up the outside features, so much of this is wildlife, and so much of it is flood prevention, so much of it is this, and so much is that. That is not unusual. It happens every time you do an irrigation project.

Mr. QUINLAN. I got the implication that on the basis of this ratio the Federal Government was subsidizing the city government in regard to administrative costs. Actually our people who purchase the water——

Senator ANDERSON. That is exactly what will happen.

Mr. QUINLAN. Our people who purchase this water will be paying in lieu of taxes for this operation.

Senator ANDERSON. One of the difficulties is that ordinarily an irrigation project is to irrigate land. It is not ordinarily for the purpose of creating a municipal water supply. We got into this 8 or 10 years ago when Amarillo came in with a big project and we approved it and passed it and then when the people found out what they were going to have to pay for water the project was never made operative from that day on.

We now have another project from west Texas that involves three or four cities—Canyon is one of them, and I don't recall the others—that want us to collect this water and use it for municipal purposes. That is not the function of the irrigation law primarily.

But it is a change that has had to be made as the water supplies of the United States have grown smaller and smaller and as demands go up.

The per capita consumption of water is up tremendously in this country. Why? There is a picture of a subdivision in Phoenix that I saw the other day, showing the layout of the streets. The layout of the streets did not interest me half as much as the layout of the

backyards. Every backyard had a swimming pool. There was not a single house without its own swimming pool.

In Phoenix the sun eats up a little water. Furthermore, every house had an air-conditioner on it. And they use the evaporative type almost exclusively in Phoenix for residences, and that eats up a little water. All those things together add up to more water in the municipalities.

I am not shocked at all at municipalities coming in and asking the Federal Government to use the reclamation laws to put in a dam to build up the municipal water supply, which has heretofore always been regarded as the job of the municipalities and not the job of the Federal Government.

It is just one of those things where I think the Federal Government can help because it is able to consolidate a number of things in it. It is no disgrace. The cost is less than it would be if you put in this project as a pure municipal project. If you put it in as a pure municipal project you would pay $19 million for it, and the current money rates being 6 percent it could not be done.

You could not sell it to your people.

Senator ANDERSON. Thank you, Mr. Quinlan.

(Mr. Quinlan submitted the following statement:)

STATEMENT OF THE CITY OF MIDWEST CITY, OKLA., IN SUPPORT OF THE NORMAN PROJECT, OKLAHOMA

HISTORY OF MIDWEST CITY

As some of you possibly already know, the history of Midwest City, and its growth closely parallels that of Tinker Air Force Base and its growth. Midwest City's original townsite and its original shopping center is located immediately north across the highway from Tinker Air Force Base. The city was incorporated in 1943 and at that time contained approximately 280 acres. The population was estimated at approximately 2,500 in the early part of 1944. Midwest City now encompasses an area of approximately 13[1] square miles (9 square miles annexed in the last 3 months) and a primary planning area of over 18 square miles. This planning area was established by a recently completed study of Midwest City by the Institute of Community Development of the University of Oklahoma. This area, by virtue of its topography and social environment should eventually be serviced by Midwest City facilities and come within its corporate limits.

The population, by the Federal census in 1950 was 10,166 and as of August 1, 1959, the population is estimated at 28,000, based on utility accounts. The utility account records indicate that the growth has leveled off somewhat to an average increase in population of approximately 1,500 per year during the last 3 years. Due to recent annexations of approximately 9 square miles, there is a very good possibility the rate of growth may again increase for the next 4 to 5 years, especially if the national trend of urbanization continues at approximately the same rate it has in the past. The primary planning area mentioned previously could very easily accommodate a population of 80,000 people or more.

PRESENT SUPPLY OF WATER

I will not attempt, in this presentation, to explain in detail our ground water source or any engineering data as this is covered quite thoroughly in other reports that are to be presented to you.

Our present supply of water is obtained solely from wells. We have 23 wells of which 20 are considered deep wells. These wells are approximately 750 feet deep and if pumped properly will yield from 200 to 250 gallons per minute. If, however, an extended dry period is experienced, the above yield would

[1] On Aug. 8, 1959, the city council annexed an additional 7 square miles to bring the total area to 20 square miles and a population approximating 35,000.

be lowered after continuous pumping. Under the present laws and the restricted financial base in which cities must operate in Oklahoma, the principal method employed to finance new wells is the general obligation bond which must be approved by the taxpaying public at an election. As a result, the growth has continuously created the demand ahead of the supply and for a period of approximately 8 years the city officials were forced to ration water about every other year. The last time this occurred was in 1954. Since then we have drilled additional wells to get up to our present number of 23. Blessed with an unusual amount of rainfall and this increased supply, we have been able to avoid rationing.

Our peak capacity at the present time is 6,500,000 m.g.d., which on the basis of 218 gallons per capita per day[2] will accommodate a population of 30,000.

NEEDS FOR WATER

Present

It it is obvious, on the basis of the above-mentioned figures, that we will need to drill additional wells even if the Norman project becomes a reality, as our population will approach at least 35,000 by 1965. As you will notice by other reports, the population estimates vary, but I feel the above figure is very realistic and could prove to be conservative. Of course, with a ground water supply, we have to have enough wells to meet a peak day demand, whereas with surface water and the resultant storage we have more flexibility in meeting this demand.

Not only is it expensive to produce water from our ground water source, because we always have to have wells to meet peak demand, but also our wells are rather expensive to drill and equip for the yield obtained. The last wells constructed in 1955, including pumps and pumphouses, but not including supply lines to holding reservoirs, cost approximately $20,000 each.

Future

Future needs, by population trends and past experience with ground water, therefore, have led the city officials of Midwest City to program and plan toward surface water. Since the early part of 1953 we, therefore, have thought only in terms of the Norman project for our future needs. This view is supported by the report furnished project cities by C. H. Guernsey and I quote: "By 1965, the earliest at which the Norman project can be constructed, this will have increased to 24,000 acre-feet of which the project cities and Tinker Field will use 14,800 acre-feet. It will be noted estimated withdrawals in 1965 will equal the probable maximum possible recharge."

If Midwest City, Del City, Norman, and the surrounding environs are to continue to adequately support a growing area and the great Tinker Air Force Base complex by providing adequate housing and proper controls to maintain the present standard of living as to health, welfare, and safety for the citizens of today as well as tomorrow, we must have an adequate supply of water for tomorrow. The water supply problem is probably the most serious and perplexing problem that faces the citizenry of central Oklahoma today.

MIDWEST CITY'S FINANCIAL STRUCTURE IN RELATION TO ITS WATER SUPPLY

Because of the State constitution and statutes, most cities in Oklahoma are restricted on their revenue base to the extent that they must rely on utilities for their principal source of revenue. In Midwest City, we obtain approximately 85 percent of our total revenue for general fund[3] purposes from utilities. Obviously we must therefore set our utility rates to make a profit, which in turn is used to finance non-revenue-producing or non-self-supporting functions, such as librarys, parks, street maintenance, police, fire, health, etc. As you can see, municipal utilities are the very lifeblood of our city, and the water supply represents the major utility. We must, therefore, keep and maintain this lifeline by obtaining an adequate and financially feasible water supply. This objective can be obtained through the construction of the Norman project.

Gentlemen, we are not asking for a grant or a give-a-way program. We are merely asking for a loan which we will pay back with interest through the purchase of water. Therefore, in behalf of the city of Midwest City, I sincerely and humbly request your favorable consideration for approval of this project.

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[2] 218 gallons per capita per day represent the peak usage.

[3] General fund is fund for all operating costs, but does not include debt services.

(The following supplemental statement was received and was ordered printed:)

SUPPLEMENTAL STATEMENT OF ROBERT QUINLAN, CITY MANAGER, MIDWEST CITY, OKLA.

Supplementing my statement before the Senate Committee on August 12, 1959, relative to the Norman project, I wish to submit the following:

In Oklahoma, municipalities do not have power to levy an ad valorem tax or property tax for the purposes of general fund operations. City-operating revenues, therefore, must be derived from charges to the users of cities' services in lieu of such taxes. Property taxes may be used as a source of revenue for debt service on capital improvements by a vote of the people. Therefore, cities use this tax for capital improvements in lieu of service charges.

Following is a breakdown of the water revenues and expenditures of Midwest City, Okla., as shown by the budget adopted for fiscal year 1959–60:

Revenues:	
Anticipated water sales	$243,485.90
Meter installation fees, in connection therewith	14,914.76
Penalties	1,700.00
Ad valorem taxes for debt service	117,596.53
Total	377,697.19
Expenditures:	
Supply and distribution costs	163,709.40
Administration and billing costs	25,000.00
Miscellaneous expenses (insurance, workmen's compensation and social security)	7,842.40
Debt service	117,596.53
Total	314,148.33
Net operating profit	63,548.86

The above figures show a profit from water utility operations of $63,548.86, but $117,596.53 of the revenue comes from taxation and, if deducted, would reflect a loss of $54,047.67 by the water department. This does not allow for any depreciation or amortization of the water system.

Senator KERR. Mr. Chairman, we are very grateful to the committee for extending the time allotted to us.

Senator ANDERSON. We will take all the time necessary. Don't worry about that.

Senator KERR. I would like to put into the record, Mr. Chairman, title III of the water supply portion of the Water Supply Act of 1958, being a part of Public Law 85–500.

Senator ANDERSON. Without objection, that will be done.

(The excerpt referred to follows:)

WATER SUPPLY ACT OF 1958

SEC. 301. (a) It is hereby declared to be the policy of the Congress to recognize the primary responsibilities of the States and local interests in developing water supplies for domestic, municipal, industrial, and other purposes and that the Federal Government should participate and cooperate with States and local interests in developing such water supplies in connection with the construction, maintenance, and operation of Federal navigation, flood control, irrigation, or multiple-purpose projects.

(b) In carrying out the policy set forth in this section, it is hereby provided that storage may be included in any reservoir project surveyed, planned, constructed, or to be planned, surveyed, and/or constructed by the Corps of Engineers or the Bureau of Reclamation to impound water for present or anticipated future demand or need for municipal or industrial water, and the reasonable value thereof, may be taken into account in estimating the economic value of

the entire project: *Provided*, That before construction or modification of any project including water supply provisions is initiated, State or local interests shall agree to pay for the cost of such provisions on the basis that all authorized purposes served by the project shall share equitably in the benefits of multiple-purpose construction as determined by the Secretary of the Army or the Secretary of the Interior as the case may be: *Provided further*, That not to exceed 30 per centum of the total estimated cost of any project may be allocated to anticipated future demands where States or local interests give reasonable assurances that they will contract for the use of storage for anticipated future demands within a period of time which will permit paying out the costs allocated to water supply within the life of the project: *And provided further*, That the entire amount of the construction costs, including interest during construction, allocated to water supply shall be repaid within the life of the project but in no event to exceed fifty years after the project is first used for the storage of water for water supply purposes, except that (1) no payment need be made with respect to storage for future water supply until such supply is first used, and (2) no interest shall be charged on such cost until such supply is first used, but in no case shall the interest-free period exceed ten years. The interest rate used for purposes of computing interest during construction and interest on the unpaid balance shall be determined by the Secretary of the Treasury, as of the beginning of the fiscal year in which construction is initiated, on the basis of the computed average interest rate payable by the Treasury upon its outstanding marketable public obligations, which are neither due nor callable for redemption for fifteen years from date of issue. The provisions of this subsection insofar as they relate to the Bureau of Reclamation and the Secretary of the Interior shall be alternative to and not a substitute for the provisions of the Reclamation Projects Act of 1939 (53 Stat. 1187) relating to the same subject.

(c) The provisions of this section shall not be construed to modify the provisions of section 1 and section 8 of the Flood Control Act of 1944 (58 Stat. 887), as amended and extended, or the provisions of section 8 of the Reclamation Act of 1902 (32 Stat. 390).

(d) Modifications of a reservoir project heretofore authorized, surveyed, planned, or constructed to include storage as provided in subsection (b), which would seriously affect the purposes for which the project was authorized, surveyed, planned, or constructed, or which would involve major structural or operational changes shall be made only upon the approval of Congress as now provided by law.

SEC. 302. Title III of this Act may be cited as the "Water Supply Act of 1958".

Approved July 3, 1958.

Senator KERR. I would like to make this comment to the committee: They have referred to water wells which are being used by all of these municipalities and by Oklahoma City. The entire metropolitan area in this vicinity is probably 500,000, or more. And the reserve supply of all of these people for water is what we call the Garber Sandstone. So in time of drought, as to Norman, Midwest City, Del City, and Oklahoma City and Tinker Air Force Base, their reserve supply in time of drought is this Garber Sandstone.

Of course, 2 or 3 years ago, when we were in the middle of that drought, they were all made keenly and acutely conscious of the very low amount that was available from that source when you divide it up among all the users. That is when the great impetus came there to develop this project so that in cases of critical shortage of supply of surface water ordinarily without this project they would all be thrown back on to this Garber Sandstone, these deep wells, and therefore the surging evidence of the necessity for this project toward these communities.

Senator ANDERSON. Thank you, Senator. Proceed with your next witness.

Senator KERR. Mr. Ray Trent, mayor of Del City. I would urge them to be as brief as possible.

STATEMENT OF RAY TRENT, MAYOR, DEL CITY, OKLA.

Mr. TRENT. Mr. Chairman and members of the committee, I am Ray Trent, mayor of Del City, Okla. I am thoroughly familiar with the growth and development of Del City, having served as its first mayor, when it was incorporated in 1948, and as councilman for two terms since that time. I am here to present our wishes and desires in regard to the Norman project, Oklahoma.

Del City, in 1948, was an area of only 320 acres with a population of less than 1,200 people. Due to its strategic location in regards to Government installations and industrial developments, we have grown and the area is now more than 3,000 acres with a population of more than 12,000 people. This represents a growth of 10 times the original area and population in a little over 10 years. Del City has outgrown all expectations of its developers. We are still growing and expect our population to increase a considerable amount in the next few years.

The growth of Del City from infancy to its present youthful stage in such a short time has been an interesting experience as it has been necessary to overcome problems which at times seemed to have no solution.

Water has always been our chief concern. Each time a new area was added to our city limits and developed, it was necessary to drill new wells to further supply the water needs of our growing city. Our entire water supply is obtained from wells. We are most fearful that the constant mining to supply our daily water needs from the present underground source will soon deplete this supply.

Already it has been necessary for us to abandon several wells because of salt water contamination and pollution. All water storage at present must be made in constructed overhead or underground tanks, which prove to be rather expensive in initial cost and maintenance.

We who officially represent the citizens of Del City feel that we are obligated to seek a means by which they can be assured an adequate water supply so that the dread of a water shortage will not be one of their worries.

We are happy to combine our efforts and assistance with our neighboring cities of Midwest City and Norman in order to obtain this adequate supply.

At the present time, surface waters are not being utilized in this area and using the water from the Norman project would allow our underground water supply to again rise to its former level. Our concern in regard to the Norman project is great, in that we feel that our future development may be adversely affected if a sizable surface water supply cannot be obtained. The prime factor of this problem is the common need of our surrounding areas of Norman and Midwest City.

The Norman project as proposed by Senate bill 1892 is most desirable to the citizens of Del City as it will furnish us a far greater water supply at a more nominal cost than we could possibly obtain on our own separate venture.

The Congress of the United States of America, by initiating and continuing the enormous housing program, has invested in the future of our country by affording the citizens of the United States the greatest opportunity of all times to enjoy the necessities and comforts of

their own modern home. To this home must flow a continuous stream of water in order for it to be maintained.

The citizens of Del City are sincerely hopeful that it might possibly be the desire of this committee to assist in the development of a future water supply for maintaining our homes by approving the Norman project.

We must solemnly and sincerely appreciate your interest in this matter and look forward to receiving your most favorable consideration.

Thank you very much.

Senator ANDERSON. Mr. Trent, as you drive out of Oklahoma City into your area, isn't there a little sign there that says "Del City"?

Mr. TRENT. Yes, sir.

Senator ANDERSON. So you are actually neighbors to all of Oklahoma City?

Mr. TRENT. Yes, sir.

Senator ANDERSON. If we could take you out of the Oklahoma City area as a water user and take Midwest City out, would that not be some additional guarantee to the water supply of Oklahoma City?

Mr. TRENT. Yes, sir.

Senator ANDERSON. I am not unwilling to do that, because we are talking about bringing some water out of the Colorado River down to the cities in the central part of New Mexico. We are very much interested in it because our city has to depend upon wells. I live south of the city. I have to depend upon wells to irrigate. I get what is left. Gradually it will get less and less. I would be happy to see the city get a supply somewhere else. I assume in the same fashion the people of Oklahoma City would have an extra guarantee by this project.

Mr. TRENT. Certainly from the time when they are forced to use their wells, which they have already.

Senator ANDERSON. This will give them a chance to recharge the underground water supply if you take your supply from this.

Mr. TRENT. Yes, sir.

Senator KUCHEL. Where does Oklahoma City gets its water?

Mr. TRENT. They have two lakes at the present time. Lake Overholser and Lake Hefner.

Senator KUCHEL. How far away are they from the city?

Mr. TRENT. At the present time, with the recent annexation, they are within the city limits.

Senator KERR. I will show the committee that, if they would like to see it.

Senator ANDERSON. Which is the one you drive around as you come into town from the west?

Mr. TRENT. Overholser.

Senator KERR. Oklahoma City is right here. Overholser and Hefner are both just northwest of Oklahoma City, and both of them get their water supply from the North Canadian River. Del City and Midwest City and Tinker Air Force Base are east of Oklahoma City. Moore and Norman are south and a little east of Oklahoma City. The fact of the matter is that all of this area east of Oklahoma City, shown outside the incorporated towns, has been taken into the towns.

Mr. TRENT. Almost all.

Senator KERR. Practically all has been annexed by Del City, Oklahoma City, Midwest City. What we have is really a metropolitan area that will go all the way from Tinker Air Force Base down to Norman, and all the way from Oklahoma City down to Norman.

The Little River drainage basin comes in here west of the whole area and has been preserved amazingly as a source of pure water. This project is in the middle of this whole metropolitan development.

Thank you very much, Mr. Trent.

Mr. Guernsey, the consulting engineer, representing Central Oklahoma Water Users Association of Oklahoma City.

I would like to have him tell you, if he has it, between the rate of taking water out of this Garber sandstone by these various municipal users and the corresponding rate of recharge of that sand.

STATEMENT OF C. H. GUERNSEY, SR., CONSULTING ENGINEER, CENTRAL OKLAHOMA WATER USERS ASSOCIATION OF OKLAHOMA CITY

Mr. GUERNSEY. Yes, sir. Thank you, Senator.

Mr. Chairman and members of the committee, in the interest of conservation of time, I will make my talk very brief.

Senator ANDERSON. This is a conservation meeting.

Mr. GUERNSEY. This is an engineering presentation of facts, showing the need for additional water supplies in this area exploding population in the central part of Oklahoma. Where the people are, there must be water. We all know that. And we are talking about drinking water.

Oklahoma City presently gets its supply from streams flowing from the west. As we all know, the rainfall, average annual rainfall drops off 1 inch for every 20 miles that we journey westward from Oklahoma City. So Oklahoma City cannot——

Senator KUCHEL. To the Pacific?

Mr. GUERNSEY. No, sir. On the eastern slope, the Rockies.

Senator KUCHEL. How far west would that go?

Mr. GUERNSEY. To the mountains.

Senator KUCHEL. Which mountains?

Mr. GUERNSEY. The Rocky Mountains, the Rocky Mountain range.

Without going into detail, I purport to show here that wells from 600 to 800 feet deep, costing from $23,000 to $24,000 each, yielding an average of say 160 gallons per minute, are not the answer to the additional source of supply that this populous section of Oklahoma may long depend. They have to have additional sources.

The source of supply is analyzed as to its economic feasibility in a report which we have prepared for the project cities. I have not a number of these copies. I do have a breakdown report.

Senator ANDERSON. Do you have one that you can file with the committee?

Mr. GUERNSEY. Yes.

Senator ANDERSON. This document will be printed following your statement.

Mr. GUERNSEY. Unless there are further questions, I would like to answer some statements that were made earlier here.

Senator ANDERSON. All right.

Mr. GUERNSEY. The total amount to be paid by the cities in our economic analysis of this project, is $12,550,500, of which $10,137,000 is to be reimbursed to the Federal Government, and $2,377,000 to be paid by the cities for a central water treating and filtration plant.

Senator ANDERSON. Will you tell us where those figures come from?

Mr. GUERNSEY. They come from the estimated costs of the allocated portion—I mean the cost of the reservoir complete, allocated to water supply to the project cities by the Bureau of Reclamation.

Senator ANDERSON. Does this include interest?

Mr. GUERNSEY. This is construction cost.

Senator KERR. You mean it is that amount plus interest?

Mr. GUERNSEY. Plus interest. This doesn't include debt service cost. It includes construction cost only.

This amount of $2,377,000 is our own firm's estimate of the cost of the central water treating and filtration plant required by the project cities. Including Tinker Fields' share, the total cost of the water treatment plant would be $3,227,000.

Senator ANDERSON. Let's get back to these figures. The Department of the Interior gave a report on this bill which you are undoubtedly familiar with.

Mr. GUERNSEY. Yes, sir.

Senator ANDERSON. Look at page 3. It has the Federal development at $13 million, interest during construction at $416,000, total Federal cost $13,508,000. It then has the municipal and industrial water supply at $6,970,000 plus interest making $7,244,000. Where do you get your figures?

Mr. GUERNSEY. That is based on the reservoir with a spillway elevation of 1,044 feet, whereas mine is based on an earlier study based on a reservoir pool elevation of 1,039 feet, which makes some difference.

Senator ANDERSON. I may be wrong, but as I got it you are talking about a smaller reservoir.

Mr. GUERNSEY. Yes, sir.

Senator ANDERSON. You have a higher figure for a smaller reservoir than the Bureau of the Budget has for a bigger reservoir.

Here is the statement from the Bureau of the Budget. You are telling us that neither the Bureau of the Budget nor the Department of the Interior know what they are talking about.

Mr. GUERNSEY. I submit a table that will fully explain my remarks about allocated costs.

As an explanation for the record, it is desired to point out that the cost allocations designated as "Federal obligation" at the top of table 4[1] are the amounts that the project cities (Norman, Midwest City, and Del City) would have to repay the Federal Government. The reservoir cost allocation of $3,917,000 is based on a reservoir having an initial conservation storage capacity of 107,300 acre-feet, with the top of the conservation pool at 1,039 feet. This reservoir is the same size as originally reported in House Document 420, 85th Congress, 2d session. The construction cost for this dam and reservoir is estimated by the Bureau of Reclamation to be about $10,369,000 on the basis of current prices. The reservoir costs and cost allocations discussed at the hearing on S. 1892 are based on a larger reservoir at the

[1] Table 4 is filed with the committee for reference purposes.

same site and presented in the report of S. 1892 by the Secretary of the Interior. The larger reservoir would have an initial conservation storage capacity of 140,900 acre-feet, with the top of the conservation pool at 1,044. The construction cost is estimated to be $11,511,000 based on current prices. Pipelines and other features of the project, exclusive of the cost of the water treatment plant, make the project construction cost total about $19 million.

I have here, sir, based on an elevation of 1,039 feet, the reimbursable portion of the project to be paid by the project cities for the pipelines and pumping stations, $6,256,000, and the allocated part of the dam and reservoir, spillway, reservoir complete, $3,917,000.

Senator ANDERSON. Where was the $12 million figure you read awhile ago?

Mr. GUERNSEY. The $12 million adds to this amount that the project cities have to pay on their own. I mean if it is——

Senator ANDERSON. You read not only a $12 million figure, you read also a $6 million figure—the reporter can find it here—for the Federal Government share.

Mr. GUERNSEY. I am speaking now of the partnership approach, which is the basis of this table.

Senator ANDERSON. Is the partnership approach in this bill?

Mr. GUERNSEY. Yes. Well, I am just analyzing it as though the partnership approach were used.

Senator ANDERSON. Wouldn't it be easier if you would testify as to what is in this bill? We are going to have to consider the bill offered by your Senators. And we hope we are going to have to consider it favorably.

Mr. GUERNSEY. I am not a competent witness to testiify on the bill, Mr. Chairman.

Senator ANDERSON. I am not trying to be critical of you. But here is a bill introduced by Senator Kerr and Senator Monroney. The committee is going to consider their bill. It is not going to consider some partnership approach. Give me the figures on their bill.

Mr. GUERNSEY. I should like to let someone who has recently studied the bill in detail talk on that.

Senator ANDERSON. You are talking about the Federal Government share being $6 million. Here is a letter from the Bureau of the Budget that says the Federal Government is going to pay $12,920,000 and it is perfectly happy to do so. Why cut them back down to $6 million if they are willing to pay $13 million? That would be my question to you. They are satisfied.

Mr. GUERNSEY. If the smaller reservoir, even, were undertaken, the project cities will have to pay out of their own pockets $12,550,000, part of it over 50 years and part of it over perhaps 25 or 30 years.

Here is where I get my $12 million.

Senator ANDERSON. That is what I want.

Mr. GUERNSEY. In the first place they will have to pay to the Federal Government $6,256,000, based on the portion of the pipelines and pumping stations, and $3,971,000 for the reservoir, the allocated part of the reservoir. That is $10,173,000. On top of that they will have to pay, separate from what they will pay the Federal Government, it will cost them an additional $2,377,000.

Senator KUCHEL. The difference is that you are talking about the cost to the cities. The chairman is talking about the reimbursement to the Federal Government. Is that right?

Mr. GUERNSEY. That is it exactly.

Senator ANDERSON. If you have some way that the Federal Government gets reimbursed without the cities doing it——

Senator KUCHEL. He is adding to the cost of the project cities what they on their own are going to have to pay for a water treatment plant after the water comes up to the municipalities.

Mr. GUERNSEY. That is right.

Senator ANDERSON. That carries it from $10 million to $12 million.

Mr. GUERNSEY. Our firm has been engaged to make this economic study and we are concerned with what they are going to pay, to have to pay. They need a realistic picture.

Senator KERR. I wonder, Mr. Chairman, if it would be constructive for Mr. Barclay to make a statement.

Senator ANDERSON. Let me ask you a question. Do you support the bill of Senators Kerr and Monroney?

Mr. GUERNSEY. I certainly do.

Senator ANDERSON. That is some basis of agreement.

(The prepared statement of Mr. Guernsey is as follows:)

STATEMENT OF C. H. GUERNSEY, CONSULTING ENGINEER, OKLAHOMA CITY, OKLA.

Mr. Chairman and members of the committee, I am C. H. Guernsey, representing C. H. Guernsey & Co., consulting engineers, of Oklahoma City.

This firm has been retained by the project cities of Norman, Midwest City, and Del City, Okla., to study their problem of water supply and to recommend remedial measures for deficiencies.

Present water supply is ground water from deep wells in the formation known to geologists as the Garber-Wellington sandstone. It underlies a limited area accessible to the project cities. Although the quality of water obtained from this water-bearing formation or aquifer, is good, the necessary average depth of wells to this formation must be around 600 to 800 feet, causing the cost of each well to approximate $23,000, and the average yield no more than 160 gallons per minute. Even though the project cities named herein are fortunate in having any ground water source of acceptable quality compared with the remaining area of the central and western half of the State, this ground water source should not be considered as an abundant and unlimited supply in any sense of the word.

We have found that this present source of supply from wells is rapidly becoming inadequate to keep pace with the rapid growth in population and the increase in per capita consumption of water which these project cities are experiencing.

By 1965 the ground water consumption in the area from which the project cities draw their present supply will at least equal the greatest possible estimated replenishment of the ground water supply, and further increases in consumption will be at the expense of depleting and exhausting such reserves of ground water storage as may exist.

The underground water-bearing structure, as well as the formation underlying the catchment area from which such replenishment as occurs must come, is predominantly close-grained sandstone having very low transmissibility. Therefore, the passage of water through it is imperceptible percolation rather than slow flow. This condition makes for an extremely low rate of recharge, much slower than the rate of withdrawal from the wells. For this reason increased withdrawals would be at the expense of the underground storage.

In the Norman area in particular the situation has already become acute. Because of geological limitations of the water-bearing formation (aquifer) as well as excessive withdrawals, there has been an alarming lowering of the water table. The Oklahoma University authorities as well as the city officials are greatly concerned because of the changing conditions in the ground water situation. I believe that representatives of the city of Norman who are here

will present factual data which justify this alarm. Norman is faced with the necessity of doing something now, and Midwest City, Del City, and Tinker Air Force Base are approaching a like situation. Although we are not officially representing Tinker Air Force Base, that nearby and highly important Government defense facility is in the same position with respect to water supply as are the project cities.

The only way in which the project cities could increase their water supply from ground water sources (i.e., wells) would be by spacing additional wells and pumping facilities over a much greater area, connecting them with gathering lines converging upon central storage, connected to distribution facilities.

While we believe that a presently adequate additional supply might be obtained under those conditions, that belief is more conjecture than positive assurance. In justification of the preceding statement, we quote from a work on ground water by C. F. Tolman, formerly professor of economic geology at Leland Stanford University and a recognized authority on ground water. Professor Tolman states: "Up to the present time the methods of making a ground water inventory have not reached the accuracy necessary to make them acceptable to all investigators." In discussing recharge of the aquifer, Professor Tolman further states (again in quotation), "It is impossible to state what may be the limits of error." His statement concerned California where records and systematic gagings are highly developed.

In the area we are dealing with, there is no well organized and systematic comprehensive gaging of observation wells, correlated with specific withdrawals, and with rainfall over the catchment area; consequently our estimates are, necessarily, assumptions.

It would not be advisable for the project cities to vote bonds and spend large sums of money for water rights, rights-of-way, wells, pumps, gathering lines, and storage facilities upon such an assumption.

Oklahoma City is not in a position to furnish water to the project cities and if it ever should be it will not be for many years in the future. On the contrary, it is more likely that Oklahoma City will desire to obtain part of its water from the Norman project during the early years of its operation, before the requirements of the project cities overtake the amount of water available from the project reservoir, and until Oklahoma City can fully develop its own additional sources of supply. The reservoir included in the Norman project as proposed by S. 1892 (86th Cong., 1st sess.) has been very carefully studied over a period of several years by the U.S. Bureau of Reclamation, having a long established record of splendid engineering practice and performance. Engineers on the staff of the Bureau in its district office at Oklahoma City and in its regional office in Amarillo are thoroughly familiar with surface water impounding problems in semiarid areas as well as in areas of seasonal rainfall. We are willing to accept their judgment as to the adequacy of the project.

Basing our opinion upon the Bureau of Reclamation's evaluation of the Norman project as proposed, we believe it is the only alternate source of water supply within reasonable availability to the project cities.

This project offers assurance, in concrete form, of a satisfactory water supply, and it is our recommendation to our clients that they avail themselves of such opportunity as may occur to obtain water from that source.

It is true that with the estimated increase in water requirements by the project cities, and with the recurrence of past drought conditions allowed for in the studies by the Bureau of Reclamation, there will be times during which even the proposed reservoir will be inadequate to meet the water demand. By maintaining their present ground water facilities on a standby basis, the project cities could make up from their ground water wells such deficiencies as might occur in water availability. Such a plan would permit the maximum possible recharge of the ground water and preserve it largely intact for future use. If the Norman project is not constructed, this opportunity for conservation of the ground water as a precious natural resource available for emergency use would be lost forever.

We are here briefly presenting the situation as it appears to us.

In further support of our conclusions, we hereby offer the following information which has influenced us in making our estimates of population trends and water consumption by the project cities. Their present estimated population is Norman, 39,000; Midwest City, 25,000; and Del City, 11,500.

In 1953 Messrs. Francis R. Cella and Robert O. Law of the College of Business Administration of the University of Oklahoma prepared an analysis of the economic potential and water requirements of north central Oklahoma for the Bureau of Reclamation.

Professor of Civil Engineering George W. Reid and Dr. William Nelson Peach, professor of economics, also of the University of Oklahoma, and of the Bureau of Water Resources Research, have also made water supply studies for southeast and central Oklahoma.

Messrs. Cella and Law, whose figures the Bureau of Reclamation apparently has considered in its studies, are more conservative in their estimates than are Dr. Peach and Professor Reid; but the higher figures of the latter, prepared 5 years later, may be accounted for by the fact that evaluating agencies seem to be having a difficult time keeping up with what is actually taking place.

For instance, the Bureau of Census in 1946 predicted a peak population for the United States of 165 million by 1990. We understand that the present population is estimated at well over 175 million.

Dr. C. H. Atkins, regional engineer for the Public Health Service, U.S. Department of Health, Education, and Welfare, Charlottesville, Va., in a paper on "Water Pollution in our Changing Environments," presented May 1, 1958, at the Southern Industrial Waste Conference at Durham, N.C., made the following statements:

"(1) The U.S. Bureau of the Census has just estimated a population of 220 million by 1975.

"(2) In becoming the greatest nation on earth, the United States has also become the greatest user of water."

Quoting Dr. Atkins further, he states (in part):

"In 1900 we were using 41 billion gallons of fresh water daily.

"In 1945, at the crest of industrial development required by World War II, we were using 150 to 160 billion gallons per day.

"In 1957 we used an estimated 270 billion gallons, or an increase of 70 percent, during the preceding 12-year period.

"In 1975 it is estimated the daily fresh water use will be 450 billion gallons and by 1980 it will have soared to almost 600 billion gallons, or more than twice as much as we now use."

In a paper by Mr. Raymond J. Faust, assistant executive secretary of the American Water Works Association, in November 1958, he calls attention to the following:

In 1925 it was good design to provide 100 gallons of water per capita per day; in 1958 the figure was 140 to 150 gallons; tomorrow it will be higher.

Further, the population of the United States is now 175 million, by 1975 the total will be 235 million, an increase of 3,300,000 per year. All these people will need water. They will be predominantly urbanites if the present trend continues. In addition, by 1975, of the present present 22 million farmers, 7 million will have migrated to town. Modern rural economy calls for much larger farms and fewer rural residents.

It is estimated that of the 60 million new people, 18 million will come to the West, 14 million to the Southwest, and 15 million to the South.

Regardless of our territorial category, whether we be West, Midwest, or South, we will get at least our proportionate share of this additional population.

These figures emphasize the necessity for cities to provide for increase in their water supply. Where people are there must be water.

The project cities will inevitably share in this general increase in population and water consumption and therefore must take appropriate measures to provide water.

By comparing and evaluating the Cella-Law and Reid-Peace reports, we estimate the population of the project cities in 2010 as follows:

Norman	70,000
Midwest City	46,000
Del City	21,000

We estimate daily per capita water consumption in 2010 as follows:

	Gallons
Norman	205
Midwest City	210
Del City	216

The higher rate for Del City is due to expected greater industrial consumption.

The present rates are 80, 81, and 78 gallons, respectively.

Naturally, all of these forecasts of population and per capita water consumption increase are predicated upon the assumption of an adequate water supply.

Since the only adequate additional supply that could be made available within a reasonable time limit which would permit the normal predicted growth of the project cities is, in our opinion, the Norman project, we would urge the construction of that project at the earliest practicable date.

In conclusion, aside from the specific needs of the communities directly affected by the Norman project, we cannot refrain from calling attention to the advisability of constructing as many as possible of such worthwhile projects as this one to take care of the continuously increasing water requirements of our exploding national population.

Senator KERR. I wonder if Mr. Barclay might make a brief statement to the committee. He is from the Bureau of Reclamation.

Senator ANDERSON. Do you subscribe to the figures submitted by the Bureau of the Budget and the Department of the Interior?

STATEMENT OF M. G. BARCLAY, AREA ENGINEER, BUREAU OF RECLAMATION

Mr. BARCLAY. The Department of Interior figures on the report that you have here are correct.

I am M. G. Barclay, area engineer at Oklahoma City.

Senator ANDERSON. Has your office made a study of this Norman project?

Mr. BARCLAY. Yes, sir.

Senator ANDERSON. Over a period of how many years have you been studying it?

Mr. BARCLAY. We initiated our studies initially about 1947 in connection with basinwide planning. We became engaged in a more detailed study of the Norman project in about 1953.

Senator ANDERSON. Do you agree with the figures that are placed here, of the total cost of about $19,042,000 on the October 1958 price?

Mr. BARCLAY. Yes, sir; that is the correct construction costs as of this date for the reservoir and other features of the project as recommended by the Department of Interior at this time.

Senator ANDERSON. Then of the $19 million, would the Federal Government pay about $13 million?

Mr. BARCLAY. Yes, sir. If I understand you correctly, that is true (this is true for the proposal for joint development, but would not be in accordance with provisions of S. 1892).

Senator ANDERSON. Would the local cost, the remaining cost of the aqueduct system, be about $6,122,000?

Mr. BARCLAY. The total construction cost of the aqueduct is $7,216,000. That is the total cost of the aqueduct system, of which $6,122,000 is the cost to the project cities, and $1,094,000 is allocated to the Air Force base.

Senator ANDERSON. That is the figure that is carried on page 3?

Mr. BARCLAY. Yes, sir.

Senator ANDERSON. Do you think that the allocation that has been made to the Federal Government in this project is a fair and reasonable allocation?

Mr. BARCLAY. Yes, sir. I think so.

It is in accordance with our understanding of the allocation procedure prescribed.

Senator ANDERSON. Is that the same allocation procedure used across the country for other parts of the country?

Mr. BARCLAY. Yes, sir.

Senator ANDERSON. There is no reason why it should not be applicable to Oklahoma City, Norman, or that area?

Mr. BARCLAY. No, sir. That is the uniform allocation procedure that we are using.

Senator ANDERSON. At what interest rate has this remaining balance that is to be paid back to the Federal Government been calculated?

Mr. BARCLAY. It has been calculated at an interest rate of 2½ percent.

Senator ANDERSON. That is not a realistic figure, is it?

Mr. BARCLAY. It approaches the recent interest rates. The last one that we have signed a contract on that I am acquainted with is 2.6 percent, or 2.591 percent to be exact.

Senator ANDERSON. In Oklahoma?

Mr. BARCLAY. Yes, sir; 2.591 percent.

Senator ANDERSON. When was that signed?

Mr. BARCLAY. The contract was signed last year. The project was authorized in February 1956.

Senator ANDERSON. If the same language is put into this project as put in the recent projects it would raise the interest rate rather substantially.

Would the project still be feasible?

Mr. BARCLAY. If the interest rate is as covered in S. 1892, and recent authorize language I am acquainted with, it would raise the rate a little bit. It would not raise it a great deal. The rate would probably be in the neighborhood of maybe 2.6 to 2.7 percent.

Senator ANDERSON. Did you hear the language that I read a while ago?

Mr. BARCLAY. Yes, sir. That was the Upper Colorado River storage project bill.

Senator ANDERSON. Has that not been put into other pieces of legislation recently at the insistence of the Bureau of the Budget?

Mr. BARCLAY. I am not personally acquainted with that specific language.

Senator ANDERSON. Does the bill provide for any interest rate?

Mr. BARCLAY. Yes, sir.

Senator ANDERSON. What interest rate?

Mr. BARCLAY. It does not provide the rate, it provides a formula. The bill (S. 1892) provides that the rate of interest shall be the interest rate on long-term outstanding Government bonds as of the date of the passage of the act.

Senator ANDERSON. The yield or the rate?

Mr. BARCLAY. The rate.

Senator ANDERSON (reading):

> Payments shall include interest on unamortized balance * * * marketable long-term securities outstanding on the date of this Act.

What is that rate now?

Mr. BARCLAY. The last certificate that I heard of is about 2.65. I believe that is the San Angelo project. Something like that. I am not sure exactly what the rate was. I think it is less than 2.7 percent.

Senator ANDERSON. Is that correct, Mr. Bennett?

Mr. BENNETT. Yes.

Mr. Chairman, may I add at this point that the language on the interest rate contained in your bill (S. 1892) is substantially that which is contained in the Water Supply Act of 1958, which is the most recent enactment by Congress dealing with interest rates. That produces a rate today of approximately 2.7 percent.

Senator KERR. That was the section of law, Mr. Chairman, which I introduced into the record a while ago. That is what you are referring to?

Mr. BENNETT. Yes, sir. The two are not identical but they are substantially the same, and they are so close that they do produce almost identical interest rates.

Senator KERR. And title III would be controlling.

I mean, any difference between the bill before you and title III would have to be resolved in favor of the language of title III.

Mr. BENNETT. At least, that is the most recent expression of Congress in that field.

Senator ANDERSON. I found out what I wanted to know. This is in line with current legislative practice?

Mr. BENNETT. Yes, sir.

Mr. BARCLAY. That is correct.

Senator ANDERSON. Do you have any questions?

Senator KUCHEL. No; no questions.

Senator ANDERSON. We have I think all of the information we need from you. You think the project is a feasible project, can be constructed approximately within the estimates that are here, and would be worthwhile to the communities and to the Federal Government?

Mr. BARCLAY. Yes, sir. I think it has the feature of conserving a vital resource, that is, your existing ground water.

If you can use surface waters and relieve the draft on ground water you are going to conserve a very vital resource, and it is essential to the well-being of the communities.

Senator ANDERSON. You agree that the amount of land put under irrigation is relatively small?

Mr. BARCLAY. Yes, sir.

Senator ANDERSON. 500 acres?

Mr. BARCLAY. Probably not to exceed 750 acres.

Senator ANDERSON. Where will that be mainly?

Mr. BARCLAY. Just immediately below the dam and in the next 2 or 3 miles below the dam.

Senator ANDERSON. Thank you very much.

Senator KERR. Mr. Chairman, we are very grateful to you.

Later, Mr. Forrest Nelson will file a statement on behalf of Francis J. Borrelli, executive director of the Oklahoma Water Resources Board.

(The following statement was subsequently submitted:)

STATEMENT OF FRANCIS J. BORRELLI, EXECUTIVE DIRECTOR, OKLAHOMA WATER RESOURCES BOARD

Hon. Clinton Anderson and members of the committee, pursuant to your formal notice of recent date relative to a public hearing before your committee regarding the authorization for construction of the Norman project located on Little River in Cleveland County, Okla., the Oklahoma Water Resources Board desires to submit this statement for the record of the hearing supporting authorization of the project. Complete technical and other pertinent information

regarding this highly desirable project is available to the committee under House Document 420, 85th Congress, 2d session. Also available in this document, under page 126, is the formal statement of the State of Oklahoma regarding the official views of the State and the several State agencies who have an interest and a responsibility under Oklahoma law regarding water resources development.

The State of Oklahoma, and especially the Oklahoma Water Resources Board, reaffirms its position regarding the desirability and urgent necessity that the Norman project be authorized for construction at the earliest practical date. At the present time the city of Norman, Midwest City, Del City, and the Tinker Air Force Base are withdrawing their water supply from the Garber-Wellington formation. It is very evident that this ground water supply will be exhausted in the very near future while the waters of Little River are flowing to the sea unused. Because of this situation the city officials and the citizens of the above communities urged the Bureau of Reclamation, Department of Interior, to make a survey of the possibility of developing a multipurpose project which would provide, among other benefits, their water supply for the future. This survey report shows that through the cooperation of the cities above mentioned as well as the city of Oklahoma City and Tinker Air Force Base, a very meritorious project can be developed—one which will afford maximum benefits of which it is capable, beginning with completion of construction of the project because in most cases the full potential of a project is not fully realized for many years. Therefore, it is possible for water users and beneficiaries to repay the cost on a schedule to meet the requirement of policy previously established by the Government.

We wish to advise the committee that under date of March 11, 1953, the Secretary of Interior notified the Oklahoma Planning and Resources Board by formal letter that he would withdraw all of the unappropriated waters in the Little River Basin. The Oklahoma Planning and Resources Board acknowledged the withdrawal and has withheld all of the unappropriated waters in withdrawal status, therefore, assuring water rights for the project.

Under date of June 9, 1959, the Oklahoma Water Resources Board, which is the legal successor to the Oklahoma Planning and Resources Board, completed a hydrographic survey of the water resources of the Little River Basin.

Under date of June 30, 1959, a suit was filed in District Court, Cleveland County, under case No. 18,409, to adjudicate the water rights of the Little River Basin. The Oklahoma Water Resources Board pledges to continue its efforts to complete the adjudication with dispatch.

We wish to advise your committee that at this time there is in progress the organization of a master conservancy district, provided for under Oklahoma law, which will be the contracting agency with the United States for the repayment of costs properly chargeable to the water user.

We wish to further advise the committee that this is one project that has all of the necessary local problems resolved so that after authorization of the project construction can be initiated without delay, therefore, we urge that the committee give the request for authorization of the project a favorable recommendation for authorization.

The Oklahoma Water Resources Board pledges its full assistance and cooperation for the early construction of the project.

Senator ANDERSON. Do you have additional witnesses?

Senator KERR. That is all.

Senator ANDERSON. Thank you very much.

I appreciate you people from Oklahoma coming in here.

Senator Monroney?

Senator MONRONEY. May we file any additional statements that come in within the next 4 or 5 days?

Senator ANDERSON. Yes. The record will stay open for that purpose.

Furthermore, opportunity will be given to the two Oklahoma Senators to review the record that is made. If there are any deficiencies in that record, or seem to be, material can be supplied to the committee.

Senator MONRONEY. I would like to express my thanks also to the chairman and members of the committee for the courtesy not only in hearing us but in extending the time so that we could make this presentation.

Senator ANDERSON. Thank you.

Mr. Bennett, before we close I want to be sure that the Bureau of Reclamation has a formal statement, either submitted for the record or presented now.

Mr. BENNETT. We have a statement. However, Mr. Palmer would like to give his presentation first.

STATEMENT OF WILLIAM I. PALMER, ASSISTANT COMMISSIONER OF THE BUREAU OF RECLAMATION

Mr. PALMER. Mr. Chairman and members of the committee, I am William I. Palmer, Assistant Commissioner of the Bureau of Reclamation. The Department has reported favorably on the bill before this committee, and has suggested a number of amendments. In the first place, one of the things that has been confusing throughout the hearings is that there are two bases of approach to this problem.

One is an all-Federal project, and the other one is a joint project.

The total cost in either instance would be the $19 million.

Senator ANDERSON. Are they both in this bill?

Mr. PALMER. This bill provides for an all-Federal project.

The report submitted to this committee in 1958 and printed as House Document 420, 85th Congress, was predicated on earlier studies by the Bureau of Reclamation and summarized data assembled in the 1954 investigation of the Norman project.

At that time the report proposed a joint development in which the cities would underwrite the costs of the pumping plants and conduits and the Federal Government would build the dam and reservoir.

Subsequent to 1954 many developments have occurred in the Norman area.

I would like to brief three or four of these for the record.

First, the severe drought of 1951 to 1957, which greatly reduced the estimated firm reservoir yield, as calculated in the 1954 report, led to the recommendation for greater capacity in the reservoir.

Hence the transition from the 107,000 acre-foot municipal water storage capacity to the 140,900 acre-foot capacity.

Second, oil exploration and production activities in the reservoir area and other factors which have significantly increased land acquisition and relocation costs of the reservoir area.

Third, increased construction costs resulting from general price increases.

Fourth, significant increases in the cost of private financing of the construction of public works, such as the proposed pipelines and pumping plants, through the sale of long-term securities.

Fifth, the significant increases in population in the area and the resultant demands upon the revenues of the cities for extending pipelines and distribution systems and facilities of that kind.

So the position of the Department as expressed in its letter to the committee is that we would still favor joint development if such development can be achieved without undue hardship on the water-user groups and within their capacity to pay.

The Bureau of the Budget, in commenting on the departmental report on the bill, took four exceptions to the departmental report.

One, that fish and wildlife costs and costs assigned to recreation be reallocated and made reimbursable.

With regard to the fish and wildlife cost we suggest that our proposal is consistent with the Wildlife Coordination Act of 1958, but the matter is one for interpretation by your committee.

In connection with the recreation aspects, the $315,000 proposed for expenditure for recreation by the Federal Government is for minimum basic sanitary and public health facilities that have become almost a standard part of recent authorizations.

Additionally, to make that rereational plant operative would take an expenditure of some $400,000 or $500,000 on the part of local interests.

Senator JACKSON. On what theory do they attempt to say that the fish and wildlife item should be reimbursed?

Mr. PALMER. Mr. McBroom is here from the Department. I would like to have him respond to that.

Senator ANDERSON. There is not a question that this is municipal water. A little different position is taken to municipal water than to reclamation projects.

Is that the basis of it?

STATEMENT OF JAMES T. McBROOM, CHIEF OF THE BRANCH OF RIVER BASIN STUDIES OF THE FISH AND WILDLIFE SERVICE

Mr. MCBROOM. I am James T. McBroom, Chief of the Branch of River Basin Studies of the Fish and Wildlife Service.

Senator Jackson, the Bureau of the Budget would like to see the fish and wildlife costs such as this reallocated to major purposes of the project because apparently they do not feel that the project should be built with this as one of the major purposes.

Senator JACKSON. This is not a major purpose, is it?

Mr. MCBROOM. No, sir. It is a purpose.

I would assume it is an equal purpose of water supply and flood control.

Senator ANDERSON. How much money is allotted to wildlife? Is it $2,360,000 nonreimbursable?

Mr. MCBROOM. Yes, sir.

Senator ANDERSON. And $3,275,000 to flood control?

Mr. MCBROOM. Yes, sir.

Senator ANDERSON. Are there floods that have been arising as a result of the streamflow?

Mr. PALMER. Yes. This is a stream that has been characterized by intermittent flooding and damage to the downstream areas.

Senator Jackson, may I respond to your inquiry, specifically on Budget's exception on wildlife, by reading from its letter:

> The report of the regional director states that the estimated fish and wildlife benefits would be realized incident to the operation of the reservoir for its dominant purposes and therefore no specific facilities of specific costs for fish and wildlife conservation are included in the plan. In view of this statement and other related information contained in the report the Bureau of the Budget recommends that the total cost be reallocated to eliminate fish and wildlife conservation purposes.

It is recognized that such action would increase the amount to be repaid by the fisheries of the project.

That is the only clue as to why. I might add in passing that this has been consistently the position of the Bureau of the Budget on other items.

Senator JACKSON. We have allowed them in the past.

Mr. PALMER. This may be a good opportunity to clarify the matter of interest.

The bill before you provides that interest will be computed as of the date of the act whereas the Water Supply Act of 1958, Public Law 85–500, provides that interest will be computed as of the first of the year in which construction is initiated.

This is minutia.

The second difference is that the bill, the language in the bill, would round the interest to the closest one-eighth of 1 percent, whereas no rounding procedure is provided in Public Law 85–500.

The Bureau of the Budget nonetheless suggested the bill (S. 1892) be amended to incorporate the provisions of Public Law 85–500 with respect to interest.

The Bureau of the Budget also suggested that the bill not be enacted unless S. 2060 had been debated and disposed of by the Senate, which bill provides for making certain flood control allocations reimbursable by identifiable beneficiaries. This also is a standard provision.

In the departmental report on the bill, one fairly substantive amendment is proposed which will be required in the event joint development is to be authorized. The other departmental recommended amendments are largely clarifying in nature, and I shall not take your time to elaborate upon them.

I have submitted a statement for the record which summarizes the information I have touched on very briefly, and a more complete statement on project features and works and what is involved therein.

Senator ANDERSON. Without objection they will be incorporated in the record at this point.

(The documents are as follows:)

STATEMENT OF BUREAU OF RECLAMATION ON BILLS TO AUTHORIZE THE NORMAN PROJECT, OKLAHOMA

Mr. Chairman, and members of the committee, we recommend the enactment of the bills under consideration to authorize construction of the potential Norman project in central Oklahoma.

The multiple-purpose Norman project will be located on the Little River near Norman, Okla. Its primary purpose would be to provide urgently needed municipal and industrial water supplies for Norman, Midwest City, Del City, and Tinker Air Force Base. It would also result in desirable flood control, fish and wildlife, and recreational benefits. Also, it would permit irrigation and more intensive cultivation of a limited area downstream from the damsite by minimizing downstream flooding.

The studies of this project by the Bureau of Reclamation were accomplished at the request of members of the Oklahoma congressional delegation who have had the support of the concerned local interests. The report of the Arkansas-White-Red River Basin Inter-Agency Committee in 1955 recognized the potentialities of the Norman project, which was included in that report as a category 1 project desirable for early development.

The Secretary of the Interior forwarded to Congress on July 1, 1958, a report on this project, together with the comments of affected States of the Arkansas River Basin, the Secretary of the Army, and interested Federal agencies and a

letter from the Bureau of the Budget expressing the administration's views on the report. This report presented findings based upon studies completed in 1954.

It was found that the Norman Reservoir, through regulation of Little River flows, would furnish a firm surface water supply adequate to satisfy the estimated requirements of the project cities and Tinker Air Force Base through the year 2010.

It was found the cost of the proposed Norman Dam and Reservoir, the pumping plants and pipelines and appurtenant works, together with interest during construction, would total about $15 million at May 1954 prices. The report proposed Federal construction of the Norman Dam and Reservoir and related minimum basic recreational facilities at a cost based on May 1954 prices of $8,605,000. It proposed Federal participation in the costs of construction of the necessary pipelines and pumping plants to the extent of $907,000 as the Tinker Air Force Base portion thereof.

The project cities, although desiring Federal construction of the aqueduct system as well as the Norman Dam and Reservoir, agreed to construct the pipelines and pumping facilities required to deliver Norman Reservoir waters to the project cities and Tinker Air Force Base and to construct necessary water treatment works.

The report found the proposed Norman project to have engineering feasibility and to be economically justified.

We have recently completed a reappraisal of the Norman project recognizing developments of significance which have occurred since completion of our basic studies in 1954.

These developments have included:

1. The severe drought of 1951–57, which greatly reduced the estimated firm reservoir yield;

2. Oil exploration and production activity in the reservoir area and other factors which have significantly increased land acquisition and relocation costs in the reservoir area;

3. Increases in construction costs resultant from general price increases;

4. Significant increases in the cost of privately financing construction of public works, such as the proposed pipelines and pumping plants, through the sale of long-term securities.

Our reappraisal has established that construction of the Norman Dam and Reservoir and the required aqueduct system remains economically justified and financially feasible. The reappraisal indicated, however, that the firm yield of the Norman Reservoir would not, in itself, be adequate to satisfy the forecast water demands of the project cities and Tinker Air Force Base. It finds the most desirable utilization of the available water resources would be under a plan for continued pumping of ground waters to the extent required during drought periods to supplement Norman Reservoir yields and thereby satisfy project water demands at least through a 50-year repayment period. The reappraisal also indicates the desirability of increasing the conservation storage capacity and that the initial cost of the enlarged Norman Dam and Reservoir, aqueduct system and appurtent works would, on the basis of current prices, be about $19 million in lieu of the $15 million originally estimated. As the total yield of the Norman Reservoir was smaller and the costs higher under the reappraisal than estimated in the 1954 report, there is a significant increase in the estimated cost of project water to the project cities.

The project interests have reviewed our reappraisal findings with respect to the Norman Reservoir, and continue to strongly support its early construction as they deem it essential to meet their water needs. They have reaffirmed their willingness to repay the reimbursable costs and, if necessary, to construct the aqueduct system, if non-Federal financing can be arranged within the repayment capacity of the contracting organization and the cities. However, they have reiterated their desire that the aqueduct system be included as a part of the Federal construction.

On the basis of advice received from the cities, the additional costs indicated by the reappraisal might constitute an excessively heavy burden on the project cities and, therefore, authorization of construction of both the Norman Dam and Reservoir and the aqueduct system by the Federal Government merits consideration. The bill being considered by your committee would provide such authorization.

In recognition of this position, our reappraisal included analysis of alternative plans for joint development or all-Federal construction. Under either plan, the

project organization would construct the necessary water treatment plant and maintain the facilities required to permit pumping of ground water whenever surface water supplies may be inadequate.

The adjoining city of Oklahoma City has initiated an extensive program of expansion of its available water supplies by import of surface supplies from southeastern Oklahoma. As an initial step, the Atoka Reservoir on Boggy Creek has been built some 100 miles from Oklahoma City and a site for a terminal reservoir near Tinker Air Force Base some 11 miles northwest of the Norman Dam site has recently been purchased. As an interim measure, pending construction of a pipeline from Atoka Reservoir and other planned facilities, responsible officials of Oklahoma City have expressed desires in conference to obtain from the potential Norman Reservoir any water supplies surplus to project requirements, if construction of the Norman Reservoir in time to assist in meeting Oklahoma City's water needs can be assured. In the event that agreements are achieved for Oklahoma City to take water from the project it is expected that the city will construct the works required to deliver waters stored in Norman Reservoir to the proposed terminal reservoir near Tinker Air Force Base, as an initial portion of its planned pipeline from Atoka Reservoir.

Interim delivery of water to Oklahoma City would result in revenues to the project organization not included in our reappraisal of the Norman project. The amount of such revenues would depend upon when the Norman Reservoir is constructed and rate at which project water demands grow, as only waters surplus to project demands would be made available to Oklahoma City. However, the project sponsors have indicated willingness to pump ground waters to satisfy project needs to the extent appropriate and thereby make the optimum amount of Norman Reservoir water available to Oklahoma City.

The Secretary of the Interior, at the request of the project interests, and in accordance with the provisions of Oklahoma law on April 6, 1953, requested withdrawal from further appropriation of all unappropriated water of Little River above the Cleveland-Pottawatomie County line so that such waters could be reserved and dedicated to the Norman project. The Oklahoma Planning and Resources Board, representing the State of Oklahoma, on May 11, 1953, made such withdrawal and on November 1, 1954, confirmed that its action reserved the withdrawn waters for the Norman project.

The provision of municipal water supply has become a major accomplishment of the reclamation program. Initial authority for municipal water supply service from reclamation projects was granted in the Town Site Act of 1906 and the authority was broadened in 1920. The growth of such service in the twenties and thirties, however, was slow. The stress put upon multiple-purpose development by the Reclamation Project Act of 1939 opened the door for greater attention to municipal water needs and since then the municipal water supply aspect of reclamation projects has become more and more important. The Water Supply Act of 1958 gives further recognition to the importance of municipal water supply along with even broader authority for including the function in Bureau of Reclamation and Corps of Engineers projects.

In 1958 the Bureau of Reclamation delivered about 800,000 acre-feet of water for municipal and industrial or other miscellaneous purposes, furnishing a full or partial supply to over 200 municipalities or similar users. This amounts to about 260 billion gallons of water or the equivalent of 4½ gallons per day to every resident of the United States.

The tremendous increase in demand for municipal water is translated into a corresponding demand for development of surface water by holdover storage reservoirs. The remaining number of good reservoir sites is as limited as our remaining water supplies. It is vital, therefore, that such sites not be wasted on single-purpose developments. Therein lies the principal reason for Federal participation in providing municipal water supplies. At a site such as the Norman site the important functions of flood control and fish and wildlife can be accommodated equally as well as that of municipal water supply. A municipality normally cannot nor should it be expected to bear the costs of these associated functions, as most of the beneficiaries from such functions come from outside the area as differentiated from those who assume the repayment obligation. Thus local participation in a Federal project through repayment with interest of all municipal water supply costs, such as proposed for the Norman project, provides the answer to efficient, economic development of the Nation's remaining water supplies.

Federal participation in the Norman project is also justified on the basis of the influence of Federal installations on population growth of the project cities. A major portion of the residents of Midwest City and Del City are employed at the nearby Tinker Air Force Base and many employees of this base also reside in Norman.

I believe the preceding furnishes you a summary of the pertinent facts concerning developments which have occurred since the Secretary of Interior transmitted to you our original report, his findings thereon, and related comments. In brief, we consider the Norman project under either the joint development plan or the all-Federal plan to be engineeringly feasible, economically justified, and financially feasible. The project water right has been established under appropriate State law. The project is strongly supported by the project interests who are now organizing a master conservancy district that will have authority to contract with the United States for repayment of project costs. Full repayment of the reimbursable costs under either plan may be expected within a 50-year period. The project is essential to permit the flows of the Little River to satisfy the urgent municipal and industrial water supply needs and at the same time to conserve the ground water resources of the area. It would furnish significant flood control benefits, fish and wildlife benefits of regional significance and desirable recreational opportunities. It is consistent with the type of projects encompassed in the reclamation program.

Further details concerning our investigations and findings are given in a more detailed statement which we submit for the record. Area Engineer M. G. Barclay, who has been in charge of the field studies, is here to discuss the project and to answer any questions on technical aspects.

Statement of Central Oklahoma Water Users Association on Norman Project, Oklahoma

LOCATION

The Norman project would be located in central Oklahoma in and adjoining the Little River Basin in Cleveland and Oklahoma Counties. Norman Dam site is in Cleveland County on the Little River. It is about 13 miles east of Norman, Okla., and about 96 miles upstream from the confluence of the Little River with the Canadian River. The urban areas and the Tinker Air Force Base which would be furnished water supplies from Norman Reservoir lie just outside the Little River Basin.

HISTORY OF INVESTIGATIONS

The Little River Basin was the subject of reports by the Corps of Engineers in 1936 and 1947. These reports concluded that improvements in that basin in the interest of flood control and allied purposes were not economically justified, and undertaking of a Federal project for these purposes would not be advisable. Following a public hearing at which local proponents presented estimates of benefits exceeding the costs of contemplated improvements, the unfavorable findings of the 1947 report were concurred in by the Board of Engineers for Rivers and Harbors and the Chief of Engineers. Local interests, however, continued active support for development of surface water resources in the Little River Basin. As a result, a member of the congressional delegation from Oklahoma in 1949 requested that, in conjunction with the comprehensive investigation of the Arkansas River Basin, initiated by the Bureau of Reclamation in 1946, the Bureau consider surface water developments in the Little River Basin which might provide water supplies for the city of Norman, and concurrently provide flood control and other purpose benefits. In compliance with this request, the Bureau initiated the Norman Project investigation in November 1949.

It was established that the needs of Norman for surface water supplies arose from the fact that ground waters being utilized to meet the city's needs were economically susceptible to only limited further development. This situation was found to exist only in adjoining urban areas utilizing the same groundwater resources. An analysis of the economic potentials of north-central Oklahoma prepared by the Bureau of Business Research of the University of Oklahoma, at the request of the Bureau of Reclamation, indicated that the city of Norman and adjoining urban areas would continue to grow if adequate and reasonably priced water supplies could be assured.

By April 1953 formal resolutions and oral discussions had established the positive interests of Norman, Midwest City, Del City, Moore, and Tinker Air Force Base in surface-water supplies from the Little River. The city of Oklahoma City in June 1953 requested the Bureau of Reclamation to include in its study any possible water which might be developed for use by that city through its municipal water supply. Project studies established that the long-range yield of the Norman Reservoir would be required for the estimated future demands of Norman, Midwest City, Del City, Moore, and Tinker Air Force Base, and that the magnitude of the water requirements of Oklahoma City preclude the use of Little River flows to satisfy more than a small fraction of those requirements. The city of Moore subsequently indicated its intent to rely on ground waters for its water supply.

With this background, a plan for the Norman project was developed. The studies of the Norman project were fully coordinated with the related interagency investigations of the Little River Basin portion of the Arkansas-White, Red River Basins which were initiated subsequent to the Norman project studies. The Norman project was included in the Arkansas-White, Red River Basins Inter-Agency Committee report completed in 1955, as a category 1 project (desirable for early development).

A feasibility report on a Norman project designed to furnish surface water supplies to Norman, Midwest City, Del City, and the Tinker Air Force Base adequate to meet the forecast 2010 water demands of those project interests was completed in October 1954 and published as House Document 420, 85th Congress. This report proposed a Norman Reservoir with a storage capacity of 363,900 acre-feet, tentatively allocated as follows:

Storage capacity in acre-feet

	Initially	At end of 100 years
Surcharge	168,000	168,000
Flood control	75,000	75,000
Municipal and industrial water supply	107,300	85,000
Sediment and dead storage	13,600	35,900
Total	363,900	363,900

The report found that the firm yield of such a reservoir over a 100-year period would be 28,600 acre-feet annually. This reservoir yield would have been adequate to fully satisfy the estimated year 2010 water demands of Norman, Midwest City, Del City, and the Tinker Air Force Base. The report, therefore, contemplated that those potential project water users would obtain their full water supplies from the Norman Reservoir.

The report found the estimated cost of the Norman Reservoir and the pipelines and pumping plants required to deliver project water supplies to the potential users to be as tabulated below:

Item	Construction expenditures [1]		Interest during construction	Construction cost
	Federal	Non-Federal		
Dam and reservoir	$8,056,000		$269,000	$8,325,000
Reservoir pumping plant	683,000		11,000	694,000
Norman pipeline	1,464,000		21,000	1,485,000
Relift pumping plant	83,000		1,000	84,000
Midwest City pipeline	3,524,000		66,000	3,590,000
Relift pumping plant	127,000		2,000	129,000
Recreational facilities	[2] 280,000	[3] $362,000		642,000
Total	14,217,000	362,000	370,000	14,949,000

[1] Includes contingencies, overhead, and general property.
[2] Minimum basic facilities.
[3] Accessory facilities.

Potental project interest evidenced their full endorsement of project proposals, their willingness to repay the reimbursable costs allocated to municipal and industrial water supply, willingness to pay the appropriate operation and maintenance costs, and desire for expedited construction of a Federal project involving the Norman Dam and Reservoir and Federal participation in the cost of the aqeduct system allocated to the Tinker Air Force Base.

Developments subsequent to completion of studies on which House Document 420 was based, have been of such significance as to merit reappraisal of the engineering feasibility, economic justification, and financial feasibility of the Norman project.

This reappraisal reaffirmed the appropriateness of early construction of a multiple-purpose Norman project. It is established that the firm yield of such reservoir would be significantly less than estimated in House Document 420 because of the occurrence of the drought of 1951–57, but that opportunity exists for satisfying the potential Norman project water users' forecast demands through at least a 50-year period under an integrated plan for operation of a larger Norman Reservoir in conjunction with a small amount of ground water pumping utilizing ground water facilities that project cities now have. The reappraisal also revealed that water supplies of significance to Oklahoma City could be furnished from Norman Reservoir on an interim basis during the early years of Norman project operation. Negotiations on this matter between representatives of the Norman project and the city of Oklahoma City recognized that the extent to which Little River flows can be made available to Oklahoma City will depend upon how soon Norman Reservoir can be built. Discussions of the reappraisal findings with the Norman project interests resulted in agreement on the physical works desirable to achieve optimum development of Little River flows, and delivery of those flows to Norman, Midwest City, Del City, and the Tinker Air Force Base.

PLAN OF DEVELOPMENT

The facilities required under the revised plan of development for the Norman project will be the same regardless of whether construction of the aqueduct system is accomplished as part of an all-Federal project or under a joint development plan, by the project organization. Either plan is multiple-purpose in scope, and provides municipal water supply, flood control, fish and wildlife, recreation, and indirect irrigation benefits. They involve construction of Norman Dam and Reservoir, an aqueduct system to deliver Little River flows to the project cities and Tinker Air Force Base, a water treatment plant to make the water suitable for domestic and industrial use, and some local works to permit integration of reservoir withdrawals with ground water pumping.

With Federal construction limited to Norman Dam and Reservoir, construction of the balance of the required works would be the responsibility of the project organization although the United States would finance the portion of the aqueduct system cost allocable to the Air Force base. Under the proposal advanced in the bill your are now considering, Federal construction would include Norman Dam and Reesrvoir and the entire aqueduct system. The latter plan would assist the project organization in financing the works which it would be obligated to construct.

NORMAN DAM AND RESERVOIR

The main feature of the Norman project will be Norman Dam and Reservoir. The dam would be a rolled earthfill structure with a crest at elevation 107.5, which is 101 feet above the streambed. The design provides an economical combination of surcharge storage and spillway capacity. Sediment storage capacity of 15,000 acre-feet provided in the reservoir design would preclude encroachment by sedimentation on the active storage capacity for a least 50 years, or the length of the repayment period. The total capactiy of the reservoir would be 398,200 acre-feet, tentatively allocated as follows:

Storage capacity in acre-feet

Purpose	Initially	After 50 years
Flood control	75,670	75,000
Water supply	140,900	130,760
Dead storage	13,570	9,380
Total controlled storage	230,140	215,140
Surcharge	168,050	168,050
Total capacity	398,190	383,190

Water supply studies indicate that the reservoir, when operated in conjunction with ground water withdrawals when necessary and at a rate considered to be completely safe and dependable, would be capable of fully satisfying the estimated project water demands at least through year 2015. They also indicate that after initial reservoir filling, assuming recurrence of past streamflows, reliance would have to be placed on the ground waters only during the 4 critical years of 1954–57 in the 33-year period of record. In that 33-year period, approximately 96 percent of the forecast demands could be met through reservoir yields and only 4 percent from the ground water.

By the time the Norman project could be completed, it is anticipated that the annual rate of withdrawal of ground water by the cities will be 14,000 acre-feet per year. Our studies of coordinated operation of the reservoir and ground water do not contemplate withdrawals in excess of 12,000 acre-feet per year from the ground water. Thus the cities will need only to maintain in operating condition the ground water facilities that they will have installed by the time Norman project is completed. As the project cities plan to maintain their ground water facilities on an operating standby basis, the proposed plan for coordinated reservoir-ground-water operation is feasible.

Norman Reservoir would provide flood-control benefits through controlling all floods of record at the Norman Dam site. The Corps of Engineers has evaluated the flood benefits which would result from construction of the Norman Reservoir. They have found that of the major floods which have occurred in the Little River Basin, the largest occurred in May and June 1932, when average rainfall over the watershed was 6.95 inches. Norman Reservoir could control this flood and the other floods of record to bankfull stage or less at the damsite, and would protect valuable farmland and property from floods originating above the dam. It would have a minor effect on the Canadian River Basin downstream from the mouth of the Little River. Flood-control benefits attributable to the Norman Reservoir on July 1953 prices total about $197,200 per year.

The Fish and Wildlife Service has found that the Norman project will create or enhance fish and wildlife habitat. The existing stream fishery of low value would be replaced by a good reservoir fishing opportunity. Inundation of the reservoir area will eliminate some upland game habitat, but waterfowl and aquatic fur animal habitat will be provided, which will more than offset the wildlife values lost due to reservoir construction. The Service has estimated the annual fishery benefits will be $189,000 and wildlife benefits $1,100 annually. Responsibility for the preservation and propagation of fish and wildlife values in the area would rest with the Oklahoma Game and Fish Department in cooperation with the Fish and Wildlife Service.

The National Park Service has concluded that the Norman project could provide reservoir recreation opportunities for the greatest population concentration in Oklahoma, currently without adequate facilities of this nature. Within a radius of 25 miles of the reservoir site are Oklahoma City, Norman, and Shawnee. In addition to the project cities, within a 50-mile distance of Norman Reservoir live almost one-fourth of all Oklahomans. The plan would provide for recreational facilities in the reservoir in accordance with the recommendations of the National Park Service. The facilities recommended for Federal construction consist of minimum basic facilities required for protection of the health and safety of the visiting public. The plan contemplates that additional recreational facilities, not appropriate for Federal construction, would be provided by local interests. Formulation of a detailed recreational plan will be accomplished by the cooperative efforts of Federal and State agencies and the water users' organization. Thus, full consideration would be given to recreational needs, to safeguarding of the public health and to problems of administer-

ing and supervising both the recreational and water supply functions of the reservoir.

By controlling floodflows of Little River, the project will permit irrigation by individual or group development of downstream lands which are presently subject to periodic flooding. These lands are in small isolated tracts totaling about 700 acres and are adaptable to private development. Their total water requirements are less than 1,000 acre-feet annually. No storage capacity in Norman Reservoir is provided for irrigation. However, established water rights for 200 acres would be satisfied by seepage flows or reservoir releases. Inflow below the dam site would provide water supplies for the balance of the irrigable lands.

The plan contemplates fee simple acquisition of reservoir lands up to the top of the flood control pool and flowage easements from this elevation to the top of the surcharge pool. This land acquisition proposal is in accordance with recommendations of the State health department to protect the quality of water for municipal purposes. It is contemplated that mineral rights will remain with the landowners under a provision whereby development of those rights would be accomplished without adverse effect on the municipal water supply and other primary reservoir functions. The present oil production facilities in the reservoir area are above the proposed normal water surface.

AQUEDUCT SYSTEM

The aqueduct system would consist of a central pumping plant located at the reservoir, a pipeline 10.7 miles in length to Norman, and a second pipeline about 20 miles in length to serve Del City, Midwest City, and Tinker Air Force Base. A relift pumping station would be required in each pipeline. Capacities of the pumps and pipelines would be equivalent to 150 percent of estimated average daily nonindustrial demands and 110 percent of industrial demands. The design capacity of the Norman pipeline would be 22 cubic feet per second throughout its length; the capacity of the Midwest City pipeline would be 36 cubic feet per second between the reservoir and Tinker Air Force Base, 28 from that point to Midwest City, and 8 between Midwest City and Del City.

Project sponsors consider a single central water treatment plant located in the vicinity of the reservoir to be desirable, rather than separate treatment facilities at each center of use. This treatment plant would be constructed by the project organization and would treat water for Tinker Air Force Base as well as for the project cities.

CONSTRUCTION COSTS

Based on October 1958 prices, the construction cost of the Norman Dam and Reservoir is estimated at $11,511,000 and $315,000 for the minimum basic recreational facilities. Construction costs of the aqueduct system would total $7,216,000. Current costs would not differ significantly from those estimates. Of the estimated $7,216,000 aqueduct system costs, $1,094,000 would be allocable to the Tinker Air Force Base.

C. H. Guernsey & Co., engineering consultants to the project cities, estimated the construction cost of the central water treatment plant at $3,227,500 in a report dated February 1959.

Thus, the total Federal construction cost under the joint development plan would total $12,920,000. Similarly, under the all-Federal plan as proposed in the bill being considered, the Federal construction cost would total $19,042,000.

SCHEDULE OF CONSTRUCTION

If adequate funds are available for construction and no unforeseen delays occur, the dam and reservoir could be built in 4 years. All necessary work on building the pumping plants and pipelines which constitute the aqueduct system could be completed within the same period. The water treatment plant also could be constructed within this period. Thus, contingent upon adequacy of Little River streamflows for reservoir filling, project water could be available for delivery by the end of the fourth year following authorization.

OPERATION, MAINTENANCE AND REPLACEMENT COSTS

Annual costs of operation, maintenance, and replacement of the dam and reservoir are estimated to total $22,200 annually on the basis of current prices. This is exclusive of the costs of the recreational and fish and wildlife aspects

of the plan which would be responsibilities of the State agencies administering the reservoir lands for those purposes. Comparable costs of the aqueduct system are estimated to total $133,000. Of this amount, $29,500 is deemed assignable to Tinker Air Force Base.

The engineering consultants of the project cities have estimated the comparable costs of water treatment at 4.9 cents per 1,000 gallons of treated water. On the basis of Bureau of Reclamation estimates of water deliveries, this would amount to an average annual cost of $307,000, of which $80,000 would be assignable to Tinker Air Force Base.

COST ALLOCATION

The estimated costs of construction of the Norman Dam and Reservoir, together with appropriate interest during construction, have been allocated among the project purposes using the separable costs-remaining benefits method as follows:

Purpose	Construction cost	Interest during construction	Total
Municipal and industrial water supply	$5,876,000	$248,000	$6,124,000
Flood control	3,275,000	129,000	3,404,000
Fish and wildlife	2,360,000	91,000	2,451,000
Recreation	315,000	0	315,000
Total	11,826,000	468,000	12,294,000

Of the $6,124,000 allocated to municipal and industrial water supply $4,851,100 is assignable to the project cities and $1,278,900 to Tinker Air Force Base.

The Federal capital cost of the aqueduct system, including interest during construction, would be $1,120,000 under the joint development plan and $7,384,000 under the all-Federal plan. Thus, the total Federal project cost would be $13,414,000 and $19,678,000 under the alternate plans.

REPAYMENT

The costs allocated to flood control, fish and wildlife, recreation, and Tinker Air Force Base are proposed to be nonreimbursable obligations of the Federal Government.

If the project organization operates and maintains the reservoir it should be given credit for the reasonable capitalized equivalent of the operation and maintenance costs assignable to nonreimbursable purposes of flood control and fish and wildlife. These credits would total $374,400.

Thus, the initial repayment obligation of the project cities would total $4,476,700 under the joint-development plan and $10,740,700 under the all-Federal plan.

We have prepared payout schedules to show the annual amounts the cities would have to pay. In preparing these schedules we have considered under what circumstances the cities could retire the investment they would have to make in the aqueduct system, as well as the costs of the necessary water treatment plant. These indicate that on the estimated schedule of water deliveries, water delivered to the project cities would initially cost about 25 cents per thousand gallons under the project plan and about 19 cents under the pending legislation. The unit water cost under both schedules would be 12 or 13 cents per thousand gallons after retirement, over a 30-year period, of the private bonds required to finance construction of the aqueduct system and water treatment plant. The schedules would extend over 40 and 50 years, respectively. They do not include any revenues which might accrue to the project organization from sale of water to Oklahoma City on an interim basis during the early years of project operation.

ECONOMIC JUSTIFICATION

Construction of the proposed works would be fully justified by the ratios of benefits to costs, which would be in excess of 2 to 1, on the basis of direct benefits alone, under either the project plan or the pending legislation.

WATER RIGHTS

The laws of Oklahoma provide for initiation of water rights acquisition in connection with conservation works which may be constructed by the United States by means of a notice addressed to the Oklahoma Planning and Resources Board. In accordance with these provisions and in compliance with request of the project interests, the Secretary of the Interior on April 6, 1953, requested that all unappropriated waters in the Little River and its tributaries originating above the Cleveland-Pottawatomie County line, which is roughly the Norman site, be withdrawn from appropriation. The Oklahoma Planning and Resources Board on May 11, 1953, made such withdrawal and on November 1, 1954, confirmed that such action reserved the withdrawn waters for the Norman project. Project studies have established that construction of the reservoir would not interfere with existing downstream rights. Perfection of the project water rights will be accomplished prior to construction of the project. Action has been taken by local interests to secure an adjudication of water rights of the Little River and a suit has been filed in the Oklahoma district court of appropriate jurisdiction.

PROJECT ORGANIZATION

The Central Oklahoma Water Users' Association was formed by the cities of Norman, Midwest City, and Del City to sponsor the Norman project. This organization has been active throughout the investigation period of the Norman project. This association recently engaged the firm of C. H. Guernsey & Co. to independently appraise their water situation and to review and advise them concerning participation in the Norman project. Mr. Guernsey, in reporting to the association, recommended development of the surface water supply through participation in a federally financed Norman project. He also recommended that the most practical method for the project cities to avail themselves of this project would be the formation of a master conservancy district. The project cities are now taking the initial steps to legally form a master conservancy district to contract with the United States for repayment of reimbursable costs. The association has also retained counsel for the purpose of perfecting the project water rights.

Mr. PALMER. In passing, I might add, Mr. Chairman that the question of interest I know is one in which you are vitally concerned and I believe Mr. Bennett has an observation on that.

Senator ANDERSON. Very well. Proceed, Mr. Bennett.

STATEMENT OF N. B. BENNETT, ASSISTANT COMMISSIONER, BUREAU OF RECLAMATION

Mr. BENNETT. I am N. B. Bennett, Assistant Commissioner, Bureau of Reclamation.

I think, Mr. Chairman, I want to call your attention only to the fact that this matter of interest rates has been one which has plagued the Government for some time. We have had passed in recent years I would judge about 20 different authorizing acts, each one of which carries somewhat different language on interest rates, varying all the way from language that produces about 2.6 percent interest to that which produces about 4⅛ percent.

We think this is a matter which can well have the attention of the committee and be cleared up.

Senator ANDERSON. You understand I tried to clear it up by introducing a bill that would change the language from the yield to the rate. I see no reason why a project should be charged with the yield on a Government bond; it should be charged with the rate which the Government pays. But somehow or other the Bureau reports unfavorably on that bill.

They think they have us hooked and they want to keep us hooked.

Mr. BENNETT. The comments of the Bureau of the Budget on this project suggest that the language be identical to that used in the Water Supply Act of 1958. We would be happy to have that applied to the upper Colorado River storage project, but they would not.

Mr. PALMER. Precisely.

Senator ANDERSON. By the procedure they have taken they have effectively stopped the development of the upper Colorado River storage project. That is one way of balancing the budget, which I think is too bad.

Do you think that the interest provisions recommended by the Bureau of the Budget are satisfactory?

Mr. BENNETT. In this instance I think they are very good.

Mr. PALMER. We certainly would not take much issue over whether we use the provisions of the bill or the amendment suggested by the Bureau of the Budget.

Senator ANDERSON. The one suggested by the Bureau of the Budget rounds it out to the nearest one-eighth to 1 percent?

Mr. PALMER. No, sir; that is the one in the bill. The one suggested by the Bureau of the Budget is consistent—as a matter of fact, it is the interest provision of Public Law 85–500 in the Water Supply Act.

Senator ANDERSON. It makes very little difference either way?

Mr. BENNETT. A fraction of a percent.

Mr. PALMER. There are some advantages to the language in the bill (S. 1892) in that it gives us a fixed amount that we can compute and calculate on and work our repayment contracts with, as of the day of authorization, rather than waiting until we turn the first shovelfull of earth.

Senator ANDERSON. That is right. You have to wait until January 1 of that year. You don't know when it will get started?

Mr. PALMER. That is the big advantage of the language of the bill.

Senator ANDERSON. Are there other comments? If not, thank you very much.

Mr. PALMER. Might I take 1 minute to sum up?

Senator ANDERSON. Yes.

Mr. PALMER. In brief we consider the Norman project under either the joint development plan or the all Federal plan as engineeringly feasible, economically justified, and financially feasible. The project water right has been established under appropriate State law. The project is strongly supported by the project interests who are now organizing a master conservancy district.

The project is essential to harness the flows of Little River and put them to urgently needed municipal use. It would furnish significant flood control benefits and fish and wildlife benefits. It provides desirable recreational opportunities of regional significance. We believe it is a good project and a good bill.

Senator ANDERSON. Thank you very much.

(Thereupon, the committee proceeded to the consideration of other business.)

(Subsequently Senator Kerr presented the following letter and two exhibits:)

CITY OF OKLAHOMA CITY, OKLA., *August 17, 1959.*

Hon. CLINTON P. ANDERSON,
Chairman, Subcommittee on Irrigation, Interior, and Insular Affairs, U.S. Senate, Washington, D.C.:

Mr. Chairman, and gentlemen of the committee, we appreciate your courtesy in permitting this statement to be filed with your committee on behalf of the Little River project, east of Norman, and southeast of Oklahoma City.

We wish to advise the committee that the construction of the proposed Little River project for the conservation of water will, in our opinion, serve the best interest of our citizens. This project appears to us to be especially desirable in the central Oklahoma area, where the recent drought, as well as the increase in population and per capita use of water, has brought about the urgent need for additional water supplies.

The city of Oklahoma City contracted with C. E. Bretz, consulting engineer, for a comprehensive long-range water supply plan. This report was filed with the mayor and city council on December 10, 1954, and recommended the construction of the proposed Little River project, as well as the development of further water supply reservoirs in southeast Oklahoma. Under this plan, the city of Oklahoma City has already constructed one reservoir, near Atoka, in southeast Oklahoma, and this reservoir is now filling with water.

If the Norman project should be delayed, and the city would be forced to construct facilities to transport water from southeast Oklahoma, then the city would have less interest in the Norman project, except for the benefit of the project cities.

On the other hand, if the Norman project should be constructed without delay, there are certain benefits which have been offered the central Oklahoma area, such a surplus water in an average annual amount of 30,000 acre-feet, for a period of approximately 15 years, and under certain conditions, surplus water in excess of this amount.

The preliminary discussions on the cost of water from this project appear to be acceptable if it becomes necessary for the city to take water prior to the construction of facilities to transport the water from southeast Oklahoma.

In our opinion, your early approval for the designing and construction of the Norman project, would be most helpful to the project cities and the central Oklahoma area. We respectfully recommend your favorable consideration.

We appreciate your consideration in permitting this statement to be presented.

Respectfully,

SHELDON L. STIRLING,
City Manager, City of Oklahoma City.
MORRISON B. CUNNINGHAM,
Superintendent and Engineer, Oklahoma City Water Department.
ANCEL EARP,
President, Oklahoma City Chamber of Commerce.
WM. MORGAN CAIN,
President, Water Development Foundation of Oklahoma, Inc.

EXHIBIT 1

NORMAN PROJECT, OKLAHOMA—PROJECT COSTS AND COMPARISON OF ALLOCATED COSTS UNDER DIFFERENT ALLOCATION PROPOSALS

At hearings on August 11, 1959, on Senate bill 1892 before the Senate Subcommittee on Irrigation and Reclamation, pertaining to the Norman project, Oklahoma, there was some confusion as to project costs and costs which were allocated to different purposes.

Project costs are based on a reservoir with a total controlled capacity of 230,140 acre-feet of which 140,900 acre-feet are for water supply as recommended by the Department of the Interior. The estimated construction cost of the various features and the total project at current prices is:

Feature:	*Construction costs*[1]
Dam and reservoir	$11,511,000
Specific minimum basic recreational facilities	315,000
Aqueduct system (pump and pipelines)	7,216,000
Subtotal	19,042,000
Water treatment plant[2]	3,227,000
Total	22,269,000

[1] Construction costs do not include interest during construction.
[2] Not a part of the project to be constructed by the Federal Government under any plan. To be constructed by project interests under all plans considered.

In order to clarify the record, three separate allocations are submitted to show the comparison of allocations made by the separable cost-remaining benefits method under three different assumptions.

Assumption No. 1

Project construction costs are allocated in accordance with S. 1892. This bill provides that the dam and reservoir, pumping plants and pipelines, and the basic recreational facilities will be financed and constructed by the Federal Government. The water treatment plant will be constructed by the project water users through private financing such as the issuance of bonds.

Construction costs

	Federal expenditure	Non-Federal expenditure	Total
Dam and reservoir	$11,511,000		$11,511,000
Aqueduct	7,216,000		7,216,000
Basic recreational facilities	315,000		315,000
Water treatment plant		$3,227,000	
Total	19,042,000	3,227,000	22,269,000

Federal construction cost allocation

Federal cost	Reimbursable by water users	Non-reimbursable	Total
Dam and reservoir:			
Water supply	$4,654,600	[1] $1,221,400	$5,876,000
Flood control		3,275,000	3,275,000
Fish and wildlife		2,360,000	2,360,000
Recreation		315,000	315,000
Aqueduct	6,122,000	[1] 1,094,000	7,216,000
Total	10,776,600	8,265,400	19,042,000

[1] Equitable share of cost for Tinker Air Force Base supply, totals $2,315,400.

Overall cost sharing

Federal Government	$8,265,400
Non-Federal	14,003,600
Total	22,269,000

Assumption No. 2

The construction costs are allocated on the basis of joint development. This plan provides that the dam and reservoir and minimum basic recreational facilities will be financed and constructed by the Federal Government. The aqueduct system consisting of pumping plants and pipelines, and the central water treatment plant will be constructed by the water users through private financing. The pro rata share of the cost of the aqueduct system attributable to serving Tinker Air Force Base will be nonreimbursable and funds therefor will be advanced by the Government to project interests to cover that part of the construction cost of the aqueduct system.

Construction costs

	Federal expenditure	Non-Federal expenditure	Total
Dam and reservoir	$11,511,000		$11,511,000
Aqueduct	1,094,000	$6,122,000	7,216,000
Basic recreational facilities	315,000		315,000
Water treatment plant		3,227,000	3,227,000
Total	12,920,000	9,349,000	22,269,000

Federal construction cost allocation

Federal cost	Reimbursable by water users	Nonreimbursable	Total
Dam and reservoir:			
Municipal water supply	$4,654,600	[1] $1,221,400	$5,876,000
Flood control		3,275,000	3,275,000
Fish and wildlife		2,360,000	2,360,000
Recreation		315,000	315,000
Aqueduct		[1] 1,094,000	1,094,000
Total	4,654,600	8,265,400	12,920,000

[1] Tinker Air Force Base, totals $2,315,400.

Overall cost sharing

Federal Government	$8,265,400
Non-Federal	14,003,600
Total	22,269,000

Assumption No. 3

Costs of the project are allocated in accordance with recommendations of the Bureau of the Budget in its letter of August 11, 1959, to the chairman of the Committee on Interior and Insular Affairs of the U.S. Senate commenting on S. 1892. These recommendations are that allocations to fish and wildlife purposes and to specific minimum basic recreational facilities not be made as separate nonreimbursable allocations. This requires that the cost of specific minimum basic recreational facilities be added to the cost of the reservoir and the total cost of the dam and reservoir and specific recreational facilities be apportioned between municipal and industrial water supply and flood control in accordance with the separable cost-remaining benefits method on the basis of a 50-year period of analysis.

Construction costs

	Federal expenditure	Non-Federal expenditure	Total
Dam and reservoir	$11,511,000		$11,511,000
Aqueduct	1,094,000	$6,122,000	7,216,000
Basic recreational facilities	315,000		315,000
Water treatment plant		3,227,000	3,227,000
Total	12,920,000	9,349,000	22,269,000

Federal construction cost allocation

	Reimbursable by water users	Non-reimbursable	Total
Federal cost:			
Dam and reservoir:			
Water supply	$6,392,600	[1] $1,677,400	$8,070,000
Flood control		3,756,000	3,756,000
Fish and wildlife	0	0	0
Recreation	0	0	0
Aqueduct		[1] 1,094,000	1,094,000
Total	6,392,600	6,527,400	12,920,000

[1] Tinker Air Force Base, totals $2,771,400.

Overall cost sharing

Federal	$6,527,400
Non-Federal	15,741,600
Total	22,269,000

EXHIBIT 2

ANALYSIS OF PROJECT WITH RESPECT TO APPLICATION OF TITLE III OF THE WATER SUPPLY ACT OF 1958

HYDROLOGY

Physical data for the Norman reservoir with conservation pool at elevation 1044 is shown in "Addendum to Report on Reappraisal of the Norman Project, Oklahoma" dated July 1959. At this elevation the adjusted capacity after 15 years (4,500 acre-feet) sediment distributed in the reservoir is 150,200 acre-feet of which 12,200 acre-feet (all below elevation 1010) is dead, leaving a net conservation capacity of 138,000 acre-feet.

An operation study was run assuming the top of conservation pool at elevation 1031 and dead storage below elevation 1010. Previously a sediment distribution had been made for 15 years sediment encroachment in a reservoir with the top of conservation pool at elevation 1039. The evaporation curves constructed for this elevation and the 15 years sediment accumulation, rather than a 10-year sediment distribution for a top of conservation pool at elevation 1031 were used. This introduced a slight error, but would not be of any consequence. The adjusted capacity after 15 years sediment at elevation 1031 was found to be 74,900 acre-feet, and at elevation 1010, 12,000 acre-feet which left a net conservation capacity of 62,900 acre-feet.

The 1975 demands of the project cities is 21,000 acre-feet per year. Seepage losses and downstream water rights were assumed to be 1,500 acre-feet per year. Using these releases from the reservoir, and assuming the project pumps would be turned on at a rate not to exceed 1,000 acre-feet per month when the content of the reservoir got below 25,000 acre-feet of capacity, the full demands could be met from the reservoir with the top of conservation pool at elevation 1031. The starting capacity was assumed to be 25,000 acre-feet. The operation study was run for the period 1926–57. The minimum capacity was found to be 12,200 acre-feet in the spring of 1957. During this period the average pumpage from the project well fields was 800 acre-feet per year. Therefore, the difference in net conservation capacity between elevations 1044, and 1031 could be used under title III or 138,000 minus 62,900 equals 75,100 acre-feet. The percentage of unneeded capacity for the first 10 years of project life to the total net conservation capacity at elevation 1044 is 75,100 divided by 138,000 or 55 percent.

Information obtained from Norman and Midwest City officials indicate that the Norman project water users will maintain their ground water supplies on a standby basis and that such maintenance will require the pumping of a total of about 1,115,000 gallons per day. Pumping is therefore consistent with the actual operation plans of the water users.

TITLE III

The report shows total cost of the reservoir to be as follows:

Construction cost	$11,511,000
Interest during construction	468,000
Capital cost	[1] 11,979,000

[1] 30 percent of $11,979,000 equals $3,593,700.

The report shows the following apportionment of reservoir costs allocated to maintenance and interest.

Norman Reservoir	Project cities	Tinker	Total
Construction cost	$4,654,600	$1,221,400	$5,876,000
Interest during construction	196,500	51,500	248,000
Capital cost	4,851,100	1,272,900	6,124,000

From hydrology (above) the unused conservation capacity during the first 10 years amounts to 55 percent of the total capacity.

$6,124,000 multiplied by 0.55 equals $3,368,200. This amount is smaller than the 30 percent of the total reservoir capital costs shown above and therefore represents the maximum amount on which interest could be deferred.

The amount of reservoir costs apportioned to the project cities for which interest could be deferred is as follows:

$4,851,100 multiplied by 0.55 equals $2,668,100. This amount would be deducted from the initial obligation shown in tables 10 and 17 (Federal Obligation) of the addendum report. In the table this amount would also be added to the unpaid principal in the 10th year.

The effect of applying the provisions of the Water Supply Act of 1958 with respect to the deferred payment on interest is shown in the attached table that gives one possibility for repayment of projects costs.

TABLE 17.—(Payout schedule) of Norman project addendum report revised to recognize Title III as explained in attached memorandum

TABLE 17.—*(Payout schedule) of Norman project addendum report revised to recognize Title III as explained in attached memorandum*

Year	Year of operation	Annual reservoir water deliveries (billions of gallons)	Total cost per thousand gallons	Gross revenue	Non-Federal obligation, water treatment plant [1]						Federal obligation, dam and reservoir and aqueduct system [1]					
					Cost per thousand gallons	Annual payment	Operation, maintenance, and repairs at 4.9 cents per thousand gallons	Interest at 4½ percent	Payment on bonds	Unpaid principal	Cost per thousand gallons	Annual payment	Operation, maintenance, and repairs	Interest at 2½ percent	Payment on principal	Unpaid balance, $8,072,600 [2]
1966	1	3.0610	17.21	$629,900	8.89	$325,400	$179,400	$107,000	$30,000	$2,377,500	8.32	$304,500	$102,400	$201,800	$300	$8,072,300
	2	3.3836	16.56	643,200	8.66	336,300	190,300	105,200	40,800	2,338,500	7.90	306,900	104,400	201,800	700	8,071,600
	3	4.1026	16.01	656,900	8.46	347,000	201,000	103,400	42,600	2,297,700	7.55	309,900	106,400	201,800	1,700	8,069,900
	4	4.3216	15.51	670,400	8.28	357,800	211,800	101,500	44,500	2,255,100	7.23	312,600	108,400	201,700	2,500	8,067,400
1970	5	4.5406	15.08	684,600	8.12	368,500	222,500	99,500	46,500	2,210,600	6.96	316,100	110,400	201,700	4,000	8,063,400
	6	4.6902	15.08	707,300	8.01	375,800	229,800	97,400	48,600	2,164,100	7.07	331,500	112,400	201,600	17,500	8,045,900
	7	4.8399	15.12	731,700	7.92	383,200	237,200	95,200	50,800	2,115,500	7.20	348,500	114,400	201,100	33,000	8,012,900
	8	4.9895	15.16	756,400	7.83	390,500	244,500	92,900	53,100	2,064,700	7.33	365,900	116,400	200,300	49,200	7,963,700
	9	5.1392	15.20	781,300	7.74	397,800	251,800	90,500	55,500	2,011,600	7.46	383,500	118,400	199,100	66,000	7,897,700
1975	10	5.2888	15.24	806,000	7.66	405,200	259,200	88,000	58,000	1,956,100	7.58	400,800	120,400	197,400	83,000	[3] 10,452,800
	11	5.4056	16.50	892,000	7.60	410,900	264,900	85,400	60,600	1,898,100	8.90	481,100	117,900	262,100	101,100	10,381,700
	12	5.5224	16.50	911,400	7.54	416,600	270,600	82,700	63,300	1,837,500	8.96	494,800	118,700	259,500	116,600	10,265,100
	13	5.6392	16.50	930,400	7.49	422,300	276,300	79,800	66,200	1,774,200	9.01	508,100	119,500	256,600	132,000	10,133,100
	14	5.7560	16.50	949,500	7.44	428,000	282,000	76,900	69,100	1,708,000	9.06	521,500	120,300	253,300	147,900	9,985,200
1980	15	5.8765	16.50	969,800	7.38	433,900	287,900	73,700	72,300	1,638,900	9.12	535,900	121,100	249,600	165,200	9,820,000
	16	5.9495	16.50	981,900	7.35	437,500	291,500	70,500	75,500	1,566,600	9.15	544,400	121,900	245,500	177,000	9,643,000
	17	6.0225	16.50	994,000	7.32	441,100	295,100	67,100	78,900	1,491,100	9.18	552,900	122,700	241,100	189,100	9,453,900
	18	6.0955	16.50	1,005,500	7.30	444,700	298,700	63,500	82,500	1,412,200	9.20	560,800	123,500	236,300	201,000	9,252,900
	19	6.1685	16.50	1,017,700	7.27	448,300	302,300	59,800	86,200	1,329,700	9.23	569,400	124,300	231,300	213,800	9,039,100
1985	20	6.2415	16.50	1,029,800	7.24	451,800	305,800	56,000	90,000	1,243,500	9.26	578,000	125,100	226,000	226,900	8,812,200
	21	6.3145	16.50	1,042,000	7.21	455,400	309,400	51,900	94,100	1,153,500	9.29	586,600	125,700	220,300	240,600	8,571,600
	22	6.2875	16.50	1,053,700	7.19	459,000	313,000	47,700	98,300	1,059,400	9.31	594,700	126,200	214,300	254,200	8,317,400
	23	6.4568	16.50	1,065,500	7.16	462,400	316,400	43,200	102,800	961,100	9.34	603,100	126,700	207,900	268,500	8,048,900
	24	6.5262	16.50	1,076,700	7.14	465,800	319,800	38,600	107,400	858,300	9.36	610,900	127,200	201,200	282,500	7,766,400
1990	25	6.5955	16.50	1,088,500	7.11	469,200	323,200	33,800	112,200	750,900	9.39	619,300	127,700	194,200	297,400	7,469,000
	26	6.6430	15.50	1,029,500	7.10	471,500	325,500	28,700	117,300	638,700	8.40	558,000	128,200	186,700	243,100	7,225,900
	27	6.6904	15.50	1,037,100	7.08	473,800	327,800	23,500	122,500	521,400	8.42	563,300	128,700	180,600	254,000	6,971,900
	28	6.7379	15.50	1,044,200	7.07	476,200	330,200	18,000	128,000	398,900	8.43	568,000	129,200	174,300	264,500	6,707,400
	29	6.7853	15.50	1,051,900	7.06	478,500	332,500	12,200	133,800	270,900	8.45	573,400	129,700	167,700	276,000	6,431,400

See footnotes at end of table.

TABLE 17.—*(Payout schedule) of Norman project addendum report revised to recognize title III as explained in attached memorandum*—Con.

Year	Year of operation	Annual reservoir water deliveries (billions of gallons)	Total cost per thousand gallons	Gross revenue	Non-Federal obligation, water treatment plant [1]						Federal obligation, dam and reservoir and aqueduct system [1]					
					Cost per thousand gallons	Annual payment	Operation, maintenance, and repairs at 4.9 cents per thousand gallons	Interest at 4¼ percent	Payment on bonds	Unpaid principal	Cost per thousand gallons	Annual payment	Operation, maintenance, and repairs	Interest at 2½ percent	Payment on principal	Unpaid balance, $8,072,600 [2]
1995	30	6.8328	15.50	$1,058,900	7.00	$478,100	$334,800	$6,200	$137,100	$137,100	8.50	$580,800	$130,200	$160,800	$289,800	$6,141,600
	31	6.8766	12.50	859,600	4.90	337,000	337,000			0	7.60	522,600	130,500	153,500	238,600	5,903,000
	32	6.9204	12.50	865,100	4.90	339,100	339,100				7.60	526,000	130,700	147,600	247,700	5,655,300
	33	6.9642	12.50	870,500	4.90	341,200	341,200				7.60	529,300	130,900	141,400	257,000	5,398,300
	34	7.0080	12.50	876,000	4.90	343,400	343,400				7.60	532,600	131,100	135,000	266,500	5,131,800
2000	35	7.0518	12.50	881,400	4.90	345,500	345,500				7.60	535,900	131,300	128,300	276,300	4,855,500
	36	7.0773	12.50	884,700	4.90	346,800	346,800				7.60	537,900	131,500	121,400	285,000	4,570,500
	37	7.1029	12.50	887,800	4.90	348,000	348,000				7.60	539,800	131,700	114,300	293,800	4,276,700
	38	7.1248	12.50	890,600	4.90	349,100	349,100				7.60	541,500	131,900	106,900	302,700	3,974,000
	39	7.1467	12.50	893,300	4.90	350,200	350,200				7.60	543,100	132,100	99,400	311,600	3,662,400
2005	40	7.1686	12.50	896,100	4.90	351,300	351,300				7.60	544,800	132,300	91,600	320,900	3,341,500
	41	7.1905	12.50	898,800	4.90	352,300	352,300				7.60	546,500	132,600	83,500	330,400	3,011,100
	42	7.2124	12.00	865,500	4.90	353,400	353,400				7.10	512,100	132,900	75,300	303,900	2,707,200
	43	7.2343	12.00	868,100	4.90	354,500	354,500				7.10	513,600	133,200	67,700	312,700	2,394,500
	44	7.2562	12.00	870,700	4.90	355,600	355,600				7.10	515,100	133,500	59,900	321,700	2,072,800
2010	45	7.2781	12.00	873,400	4.90	356,600	356,600				7.10	516,800	133,700	58,800	331,300	1,741,500
	46	7.2781	12.00	873,400	4.90	356,600	356,600				7.10	516,800	133,700	43,500	339,600	1,401,900
	47	7.2781	12.00	873,400	4.90	356,600	356,600				7.10	516,800	133,700	35,000	348,100	1,053,800
	48	7.2781	12.00	873,400	4.90	356,600	356,600				7.10	516,800	133,700	26,300	356,800	697,000
	49	7.2781	12.00	873,400	4.90	356,600	356,600				7.10	516,800	133,700	17,400	365,700	331,300
2015	50	7.2781	12.00	873,400	4.90	356,600	356,600				7.10	516,800	133,700	8,300	374,800	−43,500
Total				44,846,300		19,719,500						25,126,800	6,256,900	8,085,700	10,784,200	

[1] Exclusive of tinker Air Force Base portion.

[2] Breakdown of this figure:

Total municipal water allocation	$10,740,700
Amount on which interest is deferred	−2,668,100
Initial amount on which interest is paid	8,072,600

[3] Deferred principal, $2,668,100, added to balance in 10th year.

Note that total interest is $667,000 less than table 17 in addendum report.

X